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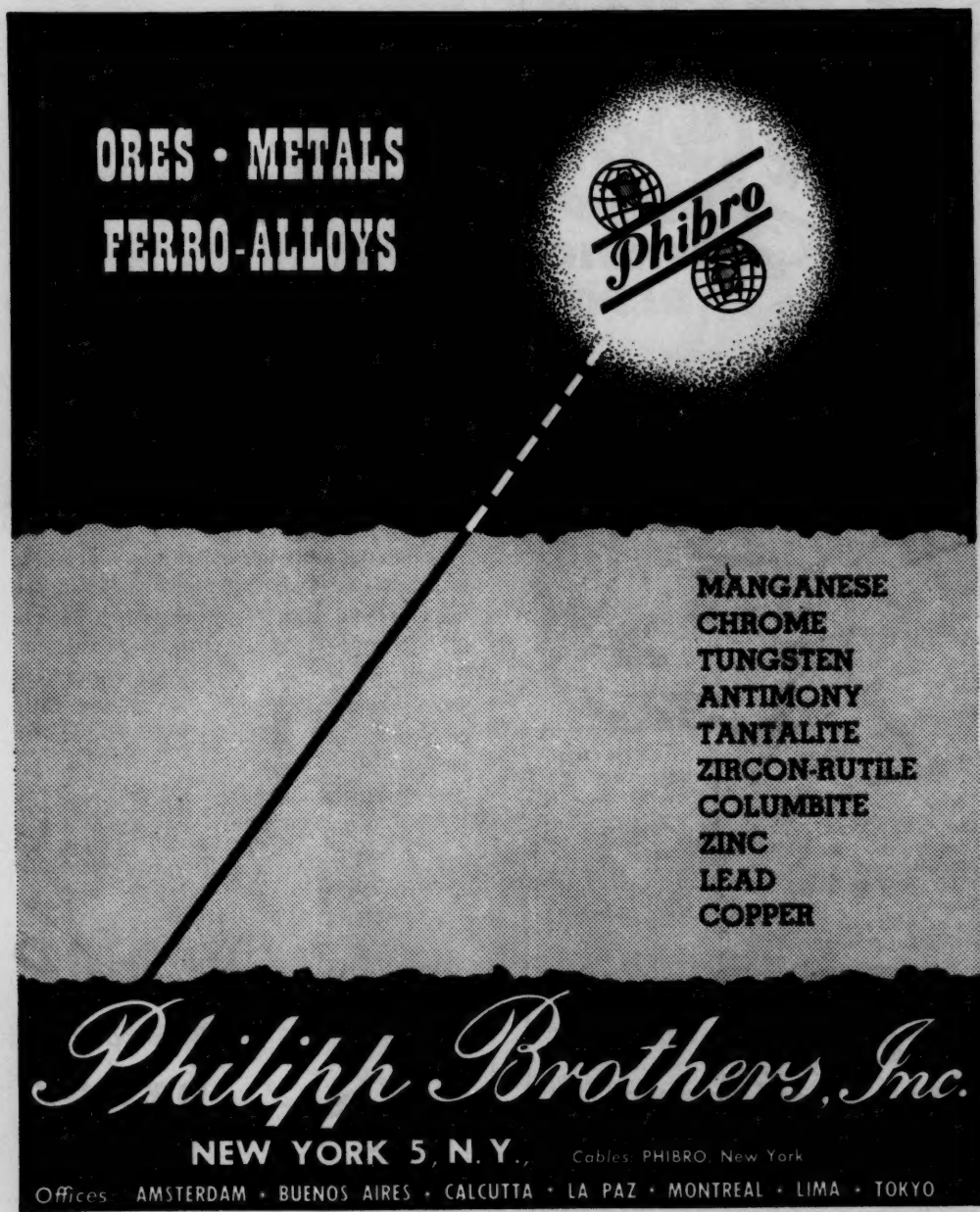

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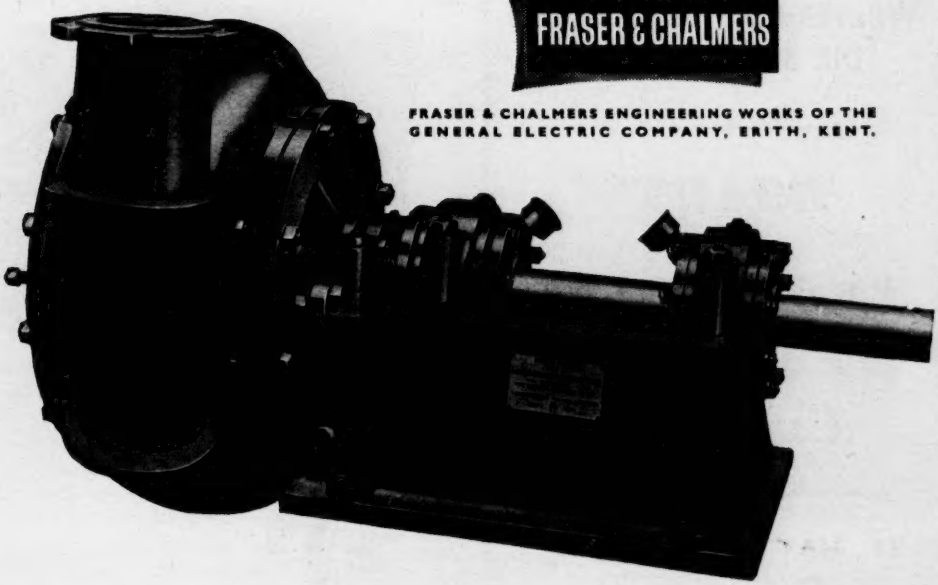

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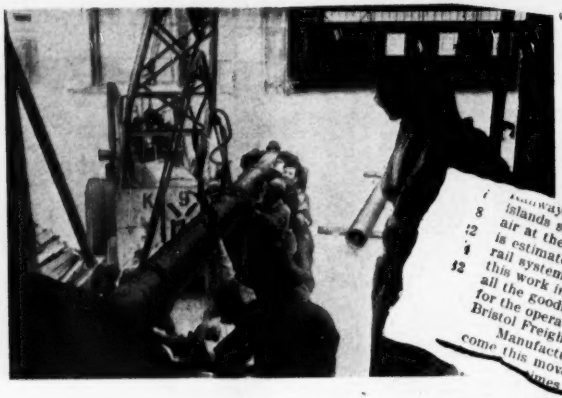

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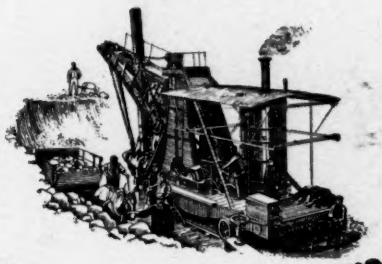

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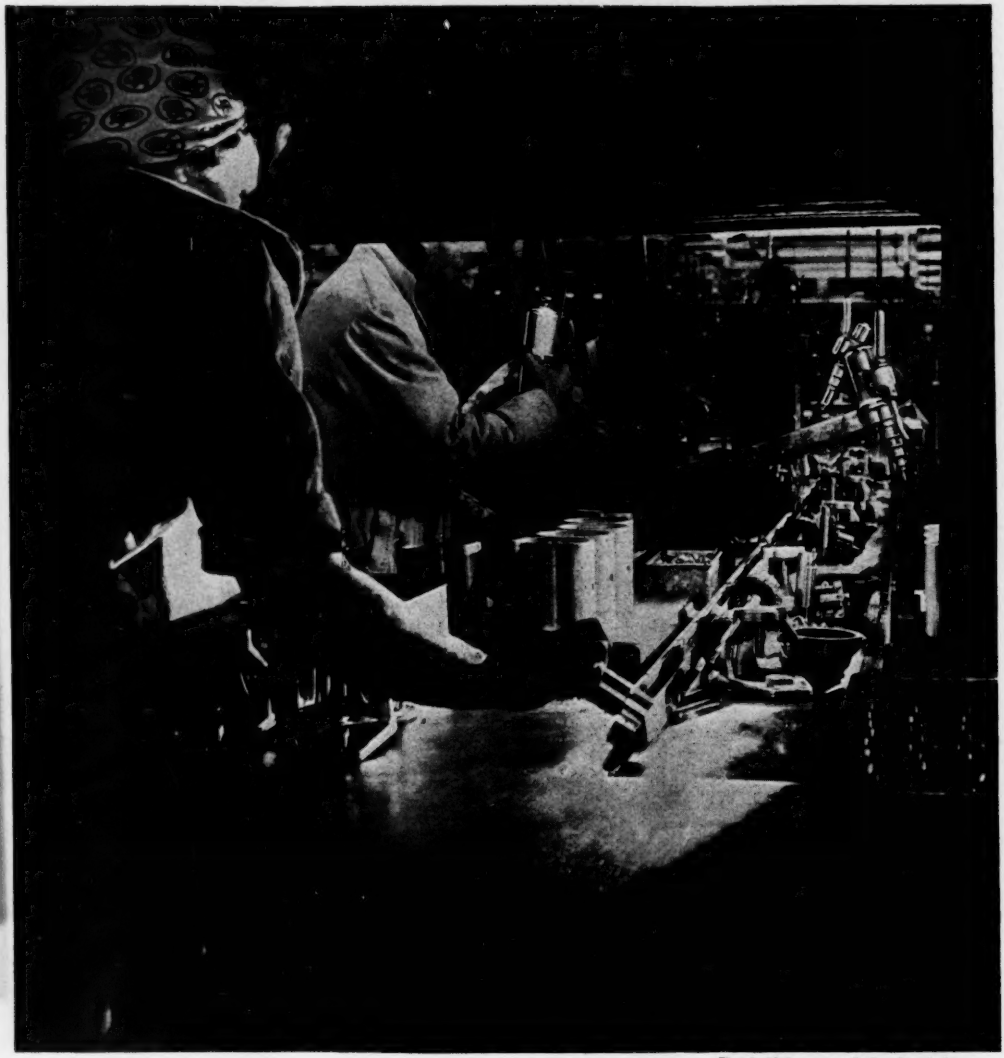

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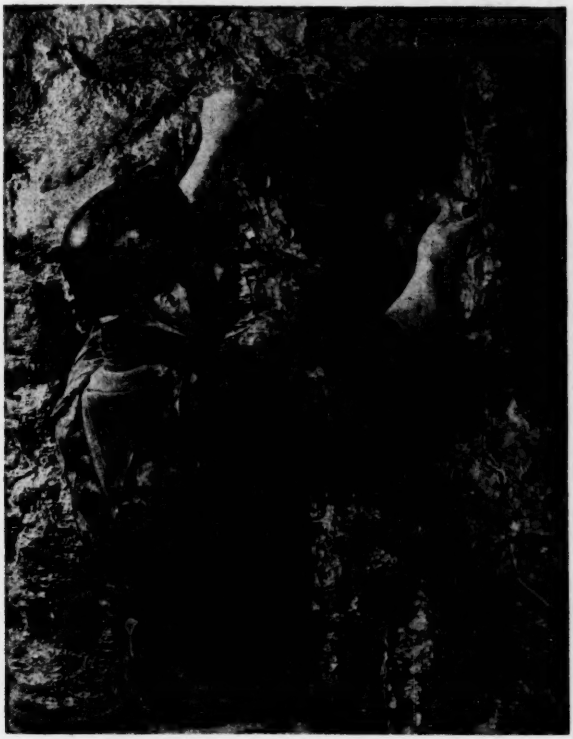

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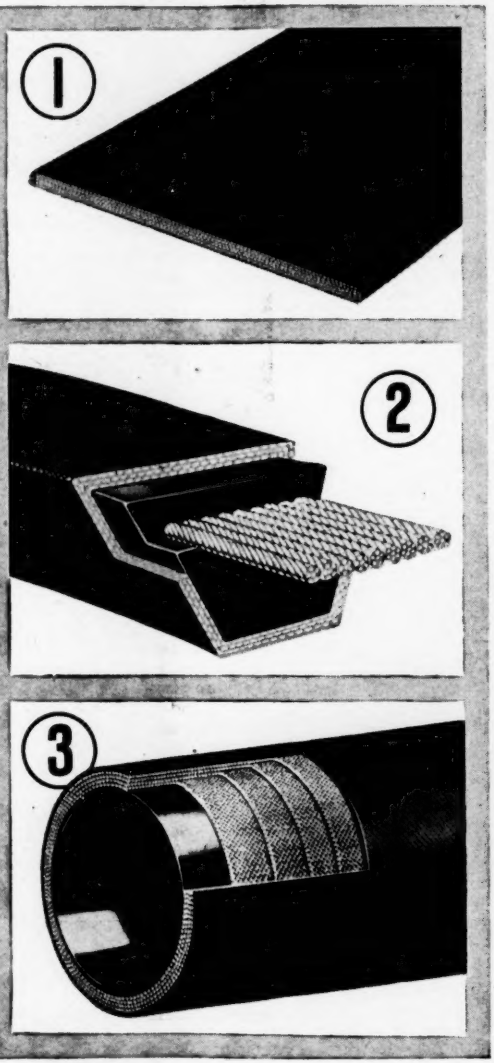

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NOTES AND COMMENTS

Apathy—the Danger to the Australian Mining Industry

Public attitude towards the mining industry is definitely apathetic, and apart from energetic effort by the large companies, interest and support are negligible at the present time, despite the abnormal prices ruling for all metals, writes our Australian correspondent. To encourage gold production in pre-war years, dividends from gold mining were exempted from income tax, and this concession to shareholders was continued during the war years and still applies. The policy was definitely successful in the years prior to 1940, and led to a great expansion in the industry. This concession was never made to base metal mining. From 1940 to 1945, and indeed, for some years after, metal prices were drastically pegged; one-third only of dividends in the hands of shareholders was exempt from income tax; allowance of calls paid in mining companies as taxation exemption was withdrawn and one-third only of such payments was permitted as an exemption claim. There was no recognition of the fact that mining is based on a wasting asset, and that dividends should be regarded as return of capital solely, until subscribed capital has been repaid. Government restrictions and discouragement during the war years laid a very solid foundation for the succeeding public apathy to the industry.

Some relaxation in onerous conditions in the past two or three years was, unfortunately, accompanied by a boom in secondary industries and in industrial shares, with quicker and much more certain profits than could be expected from mining. Consequently high metal prices proved no inducement to interest, and the taxation aspect was, and is, a strong deterrent. The fabulous price of tungsten, alone amongst metals, has provided a lure, but this is confined to the prospects of quick rises on the share market. Speculators will not pay calls for development and equipment; immediate returns from ore that can be broken and bagged without preparatory work are looked for, and if this impossible result is not forthcoming, the venture is doomed to failure. Mines, possibly with some prospects are already being abandoned because of lack of support by shareholders, to whom wolfram and scheelite were attractions; lead, zinc, copper and tin have been persistently neglected. The position is more serious than this, and it may even be said that mining is regarded in some quarters as an illegal operation, by land owners and public bodies.

Without metals, and the industry that produces them, civilization as we know it, must cease. Yet this fact is ignored to a considerable extent by individuals and bodies which seek personal or collective gain not derivable from minerals. There are cases where mineral production is prevented because the deposit is on a water storage catchment area, a projected building area, or interferes with a planned roadway. One notable instance of this attitude is given by the beach sand areas in New South Wales. This stretch of coast contains one of the world's largest and most productive sources of zircon, rutile and ilmenite. Much prominence is being given to the very rapid development of titanium metal and its great potential importance. Yet a substantial section of this mineral zone is locked up in an Air Force reserve. A much larger extent of this nationally important zircon-rutile-ilmenite area is now threatened by withdrawal from mining operations to permit the creation along the shoreline of seaside resorts, and a scenic road has been planned by local authorities. The national and strategic importance of the mineral in these sand dunes is completely ignored, and the Government seems quite indifferent to the threat to this great resource.

Australia is still a potentially great metalliferous province but due to the general apathy and lack of encouragemtn to the fundamental primary industry, she is rapidly becoming an importer instead of an exporter of metals and minerals.

India to Produce Rare Earth Compounds

A 1,000,000-volt generator for the production of neutrons, for which an order has been placed by the Atomic Energy Commission of India (which has already

bought a radium-beryllium neutron source for quantitative atomic energy work), is expected to reach Bombay in August this year, states a recent despatch from our Indian Correspondent. He also reports that the plant for the manufacture of rare earth compounds, set up by the Commission in Travancore State, is expected to go into production shortly.

According to a reply given in the Indian Assembly by the Deputy Minister for Works, Production and Supply, about 1,500 tons of monazite sand would be processed each year at the plant, and among the by-products would be 1,000 tons of rare earth chlorides and 450 tons of rare earth carbonates. About 1,500 to 1,800 tons of tri-sodium phosphate and caustic soda lye (10 to 12 per cent solution) would also be obtained as well as thorium nitrate amounting to 205 to 228 tons.

Moreover, another plant for the production of uranium and thorium compounds is to be set up shortly. This factory is expected to be self-supporting and will meet its operating cost through the sale of thorium compounds to the indigenous gas mantle industry. Raw materials used will be uranium bearing ores and thorium-uranium bearing residues of the Indian Rare Earths Ltd., Alwaye.

India has so far been importing thorium, cerium and other rare earths required for industrial purposes, but once the above two plants are in operation, she will be self-sufficient in these products and may even be able to export certain quantities.

According to the annual report of the Ministry of Natural Resources and Scientific Research, 24 research schemes in various laboratories all over India are being financed and supported by the Atomic Energy Commission of India. For instance, tracer research is being carried out at the Tata Cancer Memorial Hospital, and work on cosmic rays with the use of the Wilson cloud chamber is proceeding at various centres.

Ceylon Plans Ilmenite Reduction Plant

Fresh tenders for the establishment of the proposed ilmenite factory in Ceylon, which is estimated to cost over Rs. 7,000,000, have been called for by the Ministry of Industries, the previous tenders (called for in September, 1951) having had no satisfactory response. According to a despatch from our Ceylon Correspondent, this may be due, in part, to the fact that there are very few ilmenite reduction plants in the world other than the one in India. The project which was sanctioned by the Ceylon Government last year has been described as one that would be very profitable and, if satisfactory tenders are received, it is the intention of the Government to start the factory within a year.

The factory, which will be located at Pulmodai in the Trincomalee district, will exploit the rich ilmenite deposits that are found all along the eastern beach of the island. Ilmenite is an oxide of iron and titanium; when the iron oxide is removed the product left behind is the white oxide of titanium, which is sold as titanium white, and is one of the main sources of white paint available.

The new project proposes to treat between 100,000 and 120,000 tons of raw material per year. Out of this quantity, 65,000 to 75,000 tons of ilmenite could be obtained. In addition, zircon and rutile may also be obtained to the extent of about 4,000 tons per annum.

However, as the processing of ilmenite into the titanium white involves highly complicated technical processes, which are known only to a few manufacturing groups in the U.S.A. and in the U.K., Ceylon does not propose to process the ilmenite at present, but to export it in bulk.

Australia

(From Our Own Correspondent)

Melbourne, April 1

There is increasing interest in the Rum Jungle uranium field, 70 miles south of Darwin, Northern Territory, being developed by the Commonwealth Government; and in the Radium Hill occurrences in South Australia, which are being explored by the State Government. The latter appears to be on the verge of production, and there has been recent favourable comment on the prospects at Rum Jungle, where work has been in progress for two years. The Rum Jungle field has been visited within recent weeks by British and American authorities, who seem to be impressed with its potential importance. At present operations on the two fields are government-controlled and directed, and opportunity has not been given to private enterprise, other than in prospecting for uranium.

There is talk of American assistance in the development of the Northern Territory field, which is regrettable, in that it gives further ground for the increasing apathy of Australians toward mining in their own country. Sufficient capital is available for any such enterprises if opportunity is given, and adequate incentive by way of suitable reward for the effort and risk. Opinion favours the possible existence of other uranium occurrences in the country surrounding Rum Jungle and other discoveries may be made, if sufficient inducement is given to prospectors.

DIESEL LOCOMOTIVES

Adoption of the Diesel locomotive underground is making slow progress in Australia; so far, their use is confined to coal mines, although there is one instance of Diesel-powered trucks in a metalliferous mine.

The first use of a Diesel locomotive was in the Mount Keira colliery, in New South Wales, for the transport of men to and from the working faces at a speed of 17 miles per hour. Operation has been perfectly satisfactory from the viewpoint of the colliery management and of the Department of Mines. About the time that this locomotive commenced work, Diesel-powered motor trucks were introduced on the 750 ft. level of the Mount Morgan Mine, Queensland, to transport ore from the passes at the bottom of the open cut to the underground crusher station.

The latest application of Diesel locomotives is on the Ipswich coalfield in south Queensland, where one unit is now engaged in coal transport underground, and is the pioneer in the State. It is likely that these locomotives will be considered in the advances in mechanization of Queensland coal mines, which is now beginning. Use of Diesel power for underground transport has been approved in Victoria, but W. Australia will not permit the introduction of Diesel locomotives in either coal or metal mines.

Queensland's pioneer Diesel locomotive is small, of 15 h.p., and hauls a rake of 14 skips at a speed of 5 m.p.h.; it is Australian made, and the cost was £A.1,500. Its size and capacity have been designed for the small to moderate sized mine, which is most typical of Queensland underground collieries. In contrast, the pioneer locomotive at Mount Keira, New South Wales, also Australian made, is of 80 h.p., and is 10 tons in weight, with a drawbar pull of 6,000 lb. on first gear at 3.4 m.p.h., and 1,340 lb. on fourth gear at 17.4 m.p.h. The roadway in this case is 3 ft. 6 in. gauge and is laid with 70 lb. rails; average grades are 1 in 40, and the maximum is 1 in 12. Diesel locomotives will be used on the main haulage of the modernized Bulli Colliery of Australian Iron and Steel Ltd., New South Wales.

The Caribbean Basin Revisited*

By E. BALIOL SCOTT

The writer recently had the opportunity of revisiting some of the countries bordering the Caribbean Sea and observing the great advances that have been made by the mineral industry, especially oil, in the five years which have passed since his last visit. As the time available was limited he was unable to go to Colombia and Trinidad.

Five years is but a short time in the history of the world's extractive industries, but in oil itself it is almost a cycle. Much capital expenditure must be amortized within that period (tankers exceptionally may be conceded a life of 10 years); the world's estimated reserves may be almost doubled. Thus the five years which have elapsed since the writer visited the Caribbean Basin have witnessed vast changes.

Venezuela has been the protagonist. This country, the world's largest producer after the United States, produced 388,526,000 bbl. in 1946, its greatest output to date, but in 1951 this was surpassed by 62 per cent with a total, according to Mr. C. C. McDermond's well known statistical service, of 622,873,770 bbl.

Despite the big advances which the Eastern fields have made in the five years period, West Venezuela has fully maintained this lead; last year's output amounting to 439,039,940 bbl., or just over 70 per cent of the total output—against 183,833,830 bbl. for the East.

In the West, production from the wells in the Lake itself has been responsible for much of the increase. Here the Creole acquired most of the blocks first allocated; later the Shell organization took up large areas usually in deeper water, or at least farther off the Eastern shore. To-day the Creole is said to have over 1,600 wells producing from Lake bores.

NEW TECHNIQUE TRIED OUT

In view of the additional problems arising from the greater depth of water, the Shell interests have been trying a new technique for securing foundations of their rigs. Put in the roughest outline, the Creole rest their above water platforms on giant concrete caissons up to 90 ft. in length which are brought out to the proposed site, then upended and lowered to the bottom and settled into position. On these the platform is constructed and the bore put down in the underlying formation. The Shell engineers have evolved a braced lattice work steel structure to carry the operating platform, the main legs of which can be driven down to the firm formation underlying the Lake and which, if necessary, could be almost entirely recovered. In a later issue it is hoped to give a detailed description of this latest method.

The whole technique of working submarine oil deposits in deep water is still in an experimental and empirical stage. Fortunately, the problem of tidal or wave action on Lake Maracaibo is not as difficult as that presented by operation in the open sea and which has still to be overcome in other parts of the world.

While Cretaceous formation now being worked at depth in the Mara and La Paz fields to the north of the Lake extends under the Lake itself, it is yet to be determined whether it contains an oil accumulation. So far the oil has come only from the Eocene or younger formations but whatever the future may reveal, increasing production from the Lake wells seems assured.

The immense increase in crude production since 1947 has entailed expansion of refining capacity, which has been achieved by the construction of new plant on Venezuelan territory. Since the writer's earlier visit two large refineries have been built and are now operating on the west side of the Paraguana peninsula, north-east of Lake Maracaibo.

The Creole plant at Amuay Bay has a capacity of 70,000 bbl. daily (about 3,500,000 tons per annum) whilst the Shell refinery at Cardón has now reached about 95,000 bbl. daily (nearly 5,000,000 tons per annum) capacity and is still in course of expansion to a final design capacity of 170,000 bbl. daily (8,500,000 tons per annum) which is due to be attained during the first half of 1953.

CARDON REFINERY VISITED

The writer had the opportunity of visiting Cardón, where he saw one of the largest tankers afloat (the "Bulk Petrol" of 30,000 d.w.t.) moored at one of the several deep water wharves. As to the refinery proper, apart from the crude oil distillation, thermal cracking, reforming and polymerization units, a most interesting and significant feature is the very modern lubricating oil manufacturing complex which has recently come on stream and which is capable of producing over 100,000 tons per annum of high quality lubricating oils. This includes vacuum distillation of the crude oil residues and plants for the subsequent refining of the fractions by means of furfural extraction, propane de-asphalting, methyl-ethyl-ketone/benzol de-waxing and clay filtration. Both paraffinic and napththenic materials are handled for the manufacture of a wide range of lubricating oils.

Another scheme recently completed, is the laying of a 160 miles 30 in. pipeline from the Western fields, passing under the lake entrance near Palmarejo, to convey the crude oil to Cardón and so effect economies in transportation costs on the crude oil which was previously carried by lake tankers to the refinery.

DEEPENING ENTRANCE TO LAKE MARACAIBO

The oil companies have been dredging the entrance to the Lake of Maracaibo for some years and ships of over 20 ft. draught can now navigate through the channels at high water. The Venezuelan Government are planning to deepen the entrance channels to permit the use of ocean going ships with a draught of over 30 ft.

Time did not allow the writer to revisit Colombia and Trinidad, so he was unable to collect last year's statistics on the spot but they have been further outdistanced by Venezuela in the period under review.

Colombia: Production from Colombia has considerably increased during the five-year period and during 1951 amounted to some 38,500,000 bbl. as compared with 24.981,000 bbl. in 1947.

Trinidad output has largely marked time during the past five years and last year amounted to approximately 20,841,000 bbl. as compared with 20,500,000 bbl. in 1947.

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* C.f. *The Mining Journal*, June 14, 21, and July 26, 1947.

Since 1947 the economy of the Republic of Venezuela has been greatly strengthened by the proving and development of huge iron ore deposits in the State of Bolivar bordering on the Amacura Delta of the Orinoco which have been undertaken by the Iron Mines of Venezuela—a subsidiary of the Bethlehem Steel Corporation, and by the Orinoco Mining Co., a subsidiary of the U.S. Steel Corporation. The progress of these great undertakings have been referred to from time to time in *The Mining Journal*.

The Iron Mines of Venezuela hold extensive concessions on the northern slopes of the Cerro Imataca, the principal of which is the El Pao Mine estimated to contain 70,000,000 tonnes of high grade ore. The mine is connected by a 52 k. spur line to a point on the Orinoco where the ore is tipped into barges and taken through the Manomo Channel of the Orinoco to the Gulf of Paria and put on ocean ore carriers at Puerto de Hierro. Present scheme of shipment is some 2,000,000 tonnes annually.

VAST IRON ORE PROJECTS

Further to the west the Orinoco Mining Company is engaged in opening a much vaster project on the Cerro Bolivar, formerly known as the Sierra la Parida, about 100 k. south of Ciudad Bolivar where 100 bores are reputed to have proved some 500,000,000 tonnes of 60/65 per cent ore in a single hill while the whole concession is estimated to contain two billion tonnes. The operational scheme favoured is to dredge the Orinoco where necessary to admit ocean-going ore carriers to some point on the river near Cuidad Bolivar to be connected by rail or road with the mines. Ore shipments can hardly be expected for a couple of years and changes in detail may be made. A production rate of 10,000,000 tonnes a year is envisaged.

Besides those concessions already given out, Venezuela possesses several other big iron ore deposits notably that at San Isidro near the Cerro de Bolivar estimated at 100,000,000 tonnes and a field near the Marietta River flowing down from the Cerro Imataca to the main Delta channel of the Orinoco.

OTHER MINERALS

Various other minerals are known to occur in Venezuela some of which have been worked in the past on a greater or less scale, but the magnitude actual and potential of the petroleum and iron deposits by their drain upon manpower and enhancement of wages and consequently of the cost of living have gradually reduced interest in their exploitation.

Since 1947 the Guyanas Mines, taken over by the Canadian Frobisher Co., were closed down towards the end of 1950. Inco appears to have transferred their nickel development activities from the foothills of the Venezuelan coastal range to Lynn Lake in Canada and elsewhere. Of diamond mining little seems to be known outside the remote regions of S.E. Bolivar. The 1950 output was reported at some 60,000 carats.

The only branch of mining which appears to be expanding is that for asbestos.

Production, however, mounts to only about 200 tons a year. With the immense building activity, especially in Caracas, however, there should be a local market for all the material produced.

Minerals worked or located at various times include ores of copper, manganese, magnesium, chrome, mercury, lead, uranium, barytes, gypsum, phosphates, mica, bauxite and sulphur. But though some interest was reawakened during the war it is doubtful if they have any economic future to-day.

REVIEWS

Statistical Yearbook, 1951.—*Third Issue. Prepared by the Statistical Office of the United Nations, Department of Economic Affairs. Pp.* 617. *Tables* 178. *Obtainable from H.M.S.O.* 9 *in.* x 12 *in. Price* 45*s.* (*paper bound*), 55*s.* (*cloth bound*).

Demographic, economic, financial, social, and cultural matters and their changes during the last two decades (ending 1950 or early 1951) are tabulated in the *Statistical Yearbook*, 1951, published by the United Nations, which contains figures from nearly 250 countries and territories. The 1951 volume is the third issue of this valuable yearbook and was prepared by the Statistical Office of the United Nations with the co-operation of about 100 national statistical offices and with the assistance of United Nations specialized agencies and certain other inter-governmental bodies. This comprehensive collection of international statistics is presented in 23 chapters and is bilingual (English and French). To facilitate international comparisons, data for various countries are shown on as comparable a basis as possible and the numerous conversion factors employed are given in an appendix. Another appendix lists extensively the statistical series published by international organizations, and subject and country indexes complete the volume.

The section entitled Mining, Quarrying, gives production figures for, inter alia, coal, crude oil, natural gas, iron-ore, manganese, lead, copper, and zinc ore (indicating the metal content in each case), tin concentrates (Sn. content); bauxite, gold, silver, asbestos, magnesite, pyrites, phosphate rock and sulphur.

And So Hold On

Under the guise of a normal twentieth century adventure story, Mr. T. Rumsey Hamber has penned a neat and tongue-in-cheek skit on mining markets the world over. The hero of his novel discovers tin deposits of considerable importance beside the banks of the Niger, and thereafter combats all the savagery of jungle life to develop his claim into a working proposition, only to find that the stock markets of the civilized world are as deadly and overpowering as any of Africa's jungle belts, and that the law of nature does not peter away at the Niger's sand bar.

All the ingredients of romantic fiction are in this book which combines the usual love, adventure and tragedy of the popular raconteur with an interesting background of mining practice. Yet the discerning reader will discover in its pages a latent humour that strikes deeply to the crux of things. For without the spark of laughter that has always promoted the courage man needs to construct anything worthwhile, he would never have overcome either the savage wonder of running water or the scientific reality of gallons that pour over a shaft set in marked defiance of all geological forecasts.

Here then is a mental rest for those actively engaged in any department of the mining industry. Published by Cassell, "And So Hold On" is fair market value at 10s. 6d.

Tacheometry.—*By F. A. Redmond.* 1951, *London: The Technical Press, Ltd. Pp.* vii + 248. 5½ x 8¼ in. *Price* 21*s.*

The object of this book—which bears the sub-title "A Practical Treatise for Students and Surveyors"—is to encourage young surveyors both in this and in undeveloped countries, to take a greater interest in tacheometry and particularly in that branch known as stadia measurement.

The Preparation and Dressing of Non-Ferrous Ores in the U.S.A.

By F. BICE MICHELL

The following is the second part of a lecture to the Cornish Institute of Engineers delivered on February 21, 1952, in which the author, who is the Head of the Department of Mineral Dressing at the Camborne School of Mines, describes a few outstanding plants and interesting practices observed while he was in the United States last spring as leader of an O.E.E.C. Mission. The aim of the mission was to study techniques and machinery used in the U.S.A. for the preparation and dressing of non-ferrous and non-metallic ores. On this mission the author represented the interests of the Malayan Chamber of Mines. Below, the reader will find interesting particulars of the phosphate washing plant in Florida and of the equipment used in two U.S. ilmenite plants.

The main object of the visit to Florida was to see the phosphate washing plants and the working of alluvial ilmenite bearing sand in the northern part of the State. There are a number of plants working phosphate around Lakeland, Fla., but two of the most modern are the Noralyn plant of International Minerals and Chemical Corp. and the Sidney plant of American Cyanamid Co.

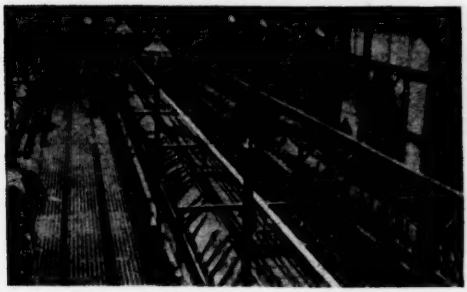
The former had a capacity of around 500 tons per hour at the time of my visit, but can handle a maximum of 700-750 tons *pH* of which approximately one third is recovered as concentrate. Actually, the feed carried some 32 per cent B.P.L. concentrate, 77 per cent B.P.L. and the tailing 6 per cent with a recovery of approximately 87 per cent. The phosphate occurs as pebbles and sand in clay and siliceous sand, very little silica being over 20 mesh.

USE OF DRAGLINE IN PHOSPHATE MINING IN FLORIDA

All mining is by dragline using a 9 cu. yd. for stripping and a 17 cu. yd. (175 ft. boom) for digging. The matrix is dumped into pits where it is disintegrated by monitors, then pumped to the washing plant, where screens and log washers free the pebbles, and flotation is employed to dress the finer and more siliceous material.

The chief interests in this plant are the washing and disintegration facilities; the very fine steel and concrete structure with pools of water on the flat roof to cool the interior by evaporation; the use of spirals as a means of separating the oiled phosphate from the siliceous sand and the development of automatic control and recording gear which made the central control room like that of a power station and enabled this enormous plant to be run with a handful of men.

At the Sidney plant, which handles about 400 cu. yd.



Flotation Belts at the Sidney Phosphate Plant of the American Cyanamid Co.

per hour the matrix is pumped from the pit in a similar manner and washing is carried out in a similar way at Novalyn, but the clay is more difficult to disintegrate, and it has been found desirable to use vertical shaft mixers, known as mud-hogs to deal with $+\frac{1}{4}$ in. gravel and clay lumps. For all finer material, ordinary log washers are used. The mud-hog consists of a 4 ft. square cell, lined with rails, closely spaced and arranged vertically. Inside a double cruciform impellor revolves at about 350 r.p.m.

Bank of Humphreys Spirals at Trail Ridge ilmenite plant of E. I. du Pont de Nemours

For dealing with large lumps of clay and nodules, a Dixie hammer mill is used, running wet, and although it leaves much to be desired, it appears to be the best known means of dealing with such lumps.

The washed material is classified using rake and Dorr Sizers which produce coarse sand for the concentrate bin, a medium size concentrated by belt flotation and the finer material for froth flotation, after desliming.

This is being carried out in 10 cyclones, each 48 in. diam. x 13 ft. high, which make an excellent classification.

BELT FLOTATION

The feed (20-48 mesh approx.) is conditioned at the rate of 90 tons per hour in a drum 6 ft. x 30 ft. fitted with an internal broken spiral and at 70 per cent solids with fatty acid, fuel oil and sodium hydroxide (*pH* 7.6 to 8.0). (See illustration in column 1.) It is then spread in three 4 ft. belts each 50 ft. long and is constantly turned and ploughed in its travel and washed by high pressure jets. Flotation is by entrapped air in these jets, which allows the oiled phosphate to run off the sides of the belt. Rods turn the matrix on the belt and so present fresh surfaces for aeration. This treatment in principle is not unlike the Holman-Michell table flotation, where air jets disturb the surface and cause flotation.

It is understood that the belts give slightly lower recovery and are inferior to tables (i.e., plain tables without air jet which simply rely on the wash water and rolling action to cause the oiled material to rise to the surface

and float by "skin flotation"). Belts, on the other hand, take less room, are easier to operate, and require less maintenance. Compared with spirals, the belts seems to be more elaborate, but may give a slightly better recovery.

ILMENITE PLANTS

Two ilmenite plants were visited and were intensely interesting because of the use of the spirals and the successful development of electrostatic separation on a large commercial scale. (See illustration in col. 2, p. 367.)

The raw material (a fine beach sand, carrying about 2 per cent of ilmenite, some rutile, leucoxene as well as zircon and some monazite) is recovered by a suction dredge. At E. I. du Pont de Nemours' Trail Ridge Plant, the sand is all -28 mesh with the bulk of the heavy minerals between 48 and 150 mesh, so that it is an ideal feed for a spiral.

The heavy minerals are concentrated by simply using spirals, this concentrate being dried and the conductors separated by electrostatic separators, eliminating zircon, any monazite, staurolite, etc., as a non-conducting fraction. The mixed titanium rich concentrate is finally split into ilmenite (magnetic) and a rutile—leucoxene fraction using magnetic separators as the latter, having a high titanium content, fetches a much higher price than ilmenite.

The non-conducting tailing contains 27 per cent zircon, and this is reconcentrated using spirals and the zircon

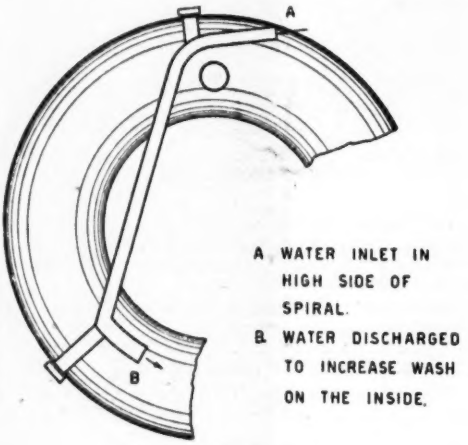


Diagram of the Coat Hanger

cleaned up. Here I do not consider that spirals do good work and for zircon cleaning tables would, I am certain, be better.

Two small items of considerable interest were (1) the use of a neoprene paint (Neobon) as a wear resisting coating on the inside of the spirals which has greatly increased the life of the cast-iron turns, and (2) the use of the coat-hanger, a device to transfer water from the almost clear zone in the outside to the inner edge of the spiral where there is a tendency to dry out and bank. (See diagram above.)

At another property owned by the National Lead Co., the feed was said to contain only 4 per cent of the total heavy minerals, with about 1.7 per cent ilmenite, 0.3 per cent rutile and 0.4 per cent zircon.

Production per annum amounts to 40,000 tons ilmenite, and 6,500 tons rutile, 11,000 tons zircon from 2,600,000 tons of feed (at rate of 360 tons per hour), whilst monazite is also produced by re-treating the non-conducting material in Weatherill magnetic separators, the concentrate assaying 56 per cent TRE and 4.5 per cent thorium oxide.

On the way North, iron plants in Alabama were visited, including a "mobile" mill using the H.N.S. process. One of the most interesting points at this plant was the fact that the ore is somewhat sticky and was washed out of the bin by means of a nozzle which not only gives a fairly uniform feed, but can also be used to blend the ore. Rubber covered punched plate screens were also in use (the 1¼ in. square screen). Only the face of the screen was covered with rubber, and so far the life is 6,000 hours compared with only 265 hours for high carbon steel punched plates.

RESURFACING WITH "HICARBON"

Here the plant was straightforward, but an interesting feature was the resurfacing of crusher mantles and roll shells with "Hicarbon" rod. (0.75 per cent C. and 0.75 per cent Mn.). The use of an automatic device for resurfacing crushing rolls by electric welding was also particularly interesting.

After seeing further phosphate plants in Tennessee and two large fluorspar flotation plants at Rosiclare, Illinois, the Federal Mill of St. Joseph Lead Co. was inspected.

California Gold Dredges and Jigs.—In California, two gold dredges were seen as well as various jigs in operation.

When jigs are employed on a dredge, one of the difficulties is to dewater the jig feed, as a feed of about 25 per cent solids is most satisfactory.

The overflow is further thickened in cones which are pivoted awartships to allow fore and aft swing due to alterations of trip when the ladder is digging.

TAHAWAS ILMENITE PLANT OF NATIONAL LEAD

This mine is a large opencast situated in the Adirondacks in a very beautiful surrounding. It was mainly interesting as a large gravity plant, using crushing to 1¼ in. and preliminary magnetic cobbing. Here about 15 per cent of the mine ore is rejected as waste.

The enriched ore is next ground in four 6 ft. x 12 ft. Marcy rod mills to 0.0291 in. each mill handling about 45 tons per hour and being closed circuited with 28 mesh stainless steel screens.

Wet magnetic separators then remove the magnetite and the remaining ilmenite rich sand is classified and concentrated on 96 tables treating an average feed of about one ton per hour.

DESLIMING CLASSIFIER OVERFLOW

The classifier overflow is deslimed using D.S.M. cyclones and a 12 in. cone made of Ni-hard steel feed at 50 p.s.i. and at rate of 350 g.p.m., makes a cut at about 20 microns. The feed carried some 5 per cent solids, overflow only 1 per cent and the underflow 65 per cent. This passes to a froth flotation plant to recover the ilmenite and all material is finally dried and cleaned magnetically. The layout was the best table plant I have ever seen with a slightly sloping floor and a cellar below to contain all launders, pumps, etc. A very interesting drier was also used which could be easily adapted for any granular concentrate.

MACHINERY AND EQUIPMENT

Commer "Superpoise" Mine Rescue Vehicle for Kilmarnock Area

The N.C.B. has recently taken delivery of a Commer "Superpoise" Mine Rescue vehicle for operation in the Kilmarnock area. When the handing over ceremony took place at Mauchline pithead, an interesting demonstration was given of the use of mine rescue equipment, which showed clearly the importance of this type of vehicle being readily available in an emergency.

The Commer "Superpoise" Mine Rescue vehicle is based on a Commer 2-3 tons "Superpoise" chassis embodying a powerful 6-cylinder engine, a perfectly co-ordinated suspension system for smooth riding, and hydraulic two-leading-shoe brakes.

The vehicle will be stationed at the Area Headquarters of the Rescue Brigade in Kilmarnock and, in the case of an accident, its duties will include the transport of specialized equipment and trained personnel to the pithead, after which it can quickly be converted for use as an ambulance if required.

Large Allis-Chalmers Crusher for U.S. Taconite Plant

A large crusher, weighing more than 625 tons, will be built by Allis-Chalmers Manufacturing Co. for use in a taconite plant to be erected at Beaver Bay, Minnesota, near the Mesabi Range, by the Reserve Mining Co., to which reference was made in "Taconite Developments in the U.S.A.," *The Mining Journal*, March 7, 1952.

The crusher, which will have a 60 in. receiving opening and a 109 in. maximum diameter crushing cone, will be capable of crushing taconite at a rate of 3,500 tons an hour from which there will be recovered more than 5,000,000 tons per year of iron concentrates, containing approximately 65 per cent iron. It will be driven by two 500 h.p. motors. Low grade iron ore will be dumped into the 60 in. annular feed opening of the crusher, the outside diameter of which will measure more than 14 ft. The unit will be able to crush pieces of taconite up to 5 ft. one dimension down to 10 in. in size.

According to G. V. Woody, manager of Allis-Chalmers processing machinery department, the crusher is so large it will take more than two years to build the patterns, make castings, and do the machine work on the unit.

The Tirfor Hoisting Machine

The Tirfor-Super—supplied by G. E. Simm Engineering, Ltd.—is a universal hoisting machine with unlimited lift. It can replace both the tackle and the winch, over which it is claimed to have numerous advantages, such as lightness and handiness, which enable it to be put in operation at a moment's notice for various tasks on the same site.

The machine—which weighs 36 lb.—consists of two pairs of automatic jaws enclosed in a casing which grip the cable. These two pairs of jaws move in opposite directions along a sleeve. The cable advances continuously during their movement because their automatic action enables them to grip the cable while they move in one direction, whereas it slides through the jaws, while they move in the opposite direction, after the fashion of the free-wheel mechanism of a bicycle.

When the lateral lever of the machine is shifted towards the hook, the pair of jaws fixed to the crank shaft moves in the same direction carrying the cable with it. Simultaneously, the other pair of jaws, actuated by connecting rods fitted on the same crank shaft, moves away from the hook, sliding along the cable. When the lever is shifted in the opposite direction, the pair of jaws fixed to the crank shaft moves away from the hook, sliding along the cable, while the other pair of jaws moves forward in its turn carrying the cable in the same direction as before and pushing it through the first pair of jaws, in which it slides, and so on. The alternating movement of the lever results in a lift of about 2¼ in. for each complete forward and backward stroke of the lever.

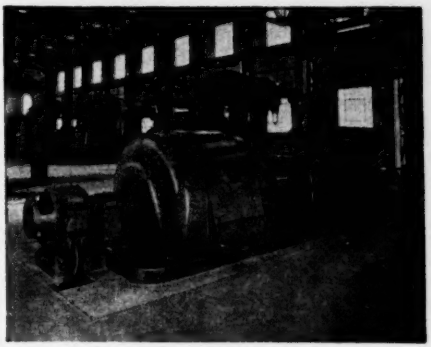
When the upper lever of the Tirfor-Super is shifted towards the hook of the machine, pressing against the connecting rods of the pair of jaws fixed to the forward motion crank shaft, that pair of jaws is locked, the pressure of the spring is eliminated and the other pair of jaws is opened, thus immediately permitting the cable to slide under the weight of the load. The first pair of jaws, which grips the cable, moves away from the hook, which at the same time the other pair of jaws moves towards it owing to the action of the crank shaft and of the connecting rods, until it reaches the safety stop.

G.E.C. Motor Driven Turbo-Type Compressors for South African Gold Mines

Since 1939, The General Electric Co., Ltd., has received orders for 27 motor driven turbo-type compressors for gold mines in South Africa. Fifteen of these compressors are in service and seven are in course of installation.

One of the two compressors for the St. Helena Mines of the Union Corporation Ltd. has recently been commissioned (see illustration). The compressor has a capacity of 20,000 cu. ft. air per minute at a pressure of 100 lb. per sq. in. absolute, when running at 5,120 r.p.m. It is driven through speed-increasing gears by a 4,485 h.p., 4-pole synchronous motor which operates at a power factor of 0.9 leading, on a 6.6 kV. 50 cycle supply.

In the background are four reciprocating compressor's which were installed several years ago. Each is driven by a 925 h.p. G.E.C. slip-ring motor.



One of two recently commissioned G.E.C. compressors for the St. Helena Gold Mine

Withdrawal of Roof Supports at Faces

According to Ministry of Fuel and Power Safety Pamphlet No. 24 entitled "The Withdrawal of Roof Supports at Faces" (H.M.S.O., price 6d.), safety in support with withdrawal depends on the props and chocks at the waste edge being closely enough spaced and not overloaded; on the provision and regular use of suitable tools—sylvesters, twisters and anchor props—to reduce or avoid any need to ease the support by hammering, sowing or chipping and on the adoption of a good method, reducing to a minimum the extent to which persons are exposed near ground disturbed by the withdrawal operations.

The authors suggest that managements should review their existing methods of support withdrawal, in order if necessary, to bring them into line with accepted good practice. It is felt that such a review would in certain cases lead to the elimination of undersirable practices and so to a saving of life and limb.

METALS, MINERALS AND ALLOYS

As we go to Press, the American steel stoppage appears momentarily to have been averted. Early to-day, President Truman took over the country's steel industry, shortly before the steelworkers were due to walk out. There have been two immediate reactions to this dramatic action.

The Unions have called off the strike stating that they would "continue to work for their Government" despite the fact that Mr. Sawyer, Secretary of Commerce, has announced that he would not implement any of the W.S.B. recommendations "until the parties arrived at an agreement."

Two of the biggest steel companies have reacted to the President's intervention by challenging his seizure order in the courts. Their application for a temporary restraining order as a preliminary to an eventual permanent injunction against the President's action is being heard this afternoon. All the other steel companies are expected to file similar suits. Meanwhile there were indications early to-day that some of the steel companies might not recall their men to work immediately. The Jones & Laughlin Steel Corp., for example, is reported to have told the Unions that it would call their men back as it saw fit.

From the point of view of the British steel user, the most hopeful news was the announcement, shortly after President Truman's intervention, that the N.P.A. had authorized the resumption of steel exports which, earlier in the week, had been banned in anticipation of the stoppage.

COPPER.—No agreement has been reached by Chile and the U.S. The Chilean Government is sending the president of the Foreign Trade Board and a former Minister of Economy to take part in the discussions. As time goes by, the American position appears to be weakening. The U.S. Government has signed yet another agreement for domestic copper at a price above the domestic level. Once again the amount is not large—only 600 s.tons each year for two years—but the government has apparently thought the amount worth negotiating. The price payable in this instance is 31.6c. per lb.; the usual termination clauses have been included.

The successful conclusion of an agreement with Chile for her entire copper output could avoid the necessity of reducing civilian consumption in the U.S. by 15 per cent during the current year. Since the sales of the free 20 per cent of Chile's output have been hesitant, both sides seem to be evenly matched. The strike originally planned for April 6, by the Chuquicamata and Porterillos workers has been postponed until April 25.

The Canadian price of electrolytic copper at Montreal dropped during the week from 27.20 Canadian cents to 27.10 Canadian cents per lb., f.o.b. Toronto.

The opening of Mount Isa's copper plant, originally planned for early this year and later postponed until June, will have to be delayed still further. This plant, costing £A.3,000,000 will double the Australian output of copper to 18,000 tons per annum. The delays have sprung mainly from difficulties in connection with certain equipment and materials required.

LEAD.—As will be seen from the table on the opposite page primary lead consumption in the U.K. in February shows a further decrease at 15,858 tons compared with 17,888 tons in January. Stocks also increased substantially during the month. These statistics reflect the continuing slack demand for the metal which is now obtainable for sterling at £150 a ton or less compared with the Government price of £163. A further reduction in the Ministry's price seems bound to come fairly soon.

TIN.—Commenting on the Anglo American tin and aluminium for steel agreement in January, *The Mining Journal* pointed out that the United States was clearly endeavouring to by-pass the market and come to terms with the producers one by one; tactics which would, it was suggested, inevitably lead, in the last analysis, to the suspension of the free tin market. Since then U.S. negotiations with Indonesia and Belgium have gone considerably further towards freezing the world price at $1.18 per lb. f.o.b.

Apart from this regrettable flight from free markets for a commodity which is in adequate supply, the U.S. administration is now confronted with a problem of its own making in the negotiation of a new Bolivian contract. Both for strategic and political considerations it is very much to the States' interest that a considerable tonnage of Bolivian ore should always be available to the Texas smelter. Equally, as this smelter is designed to handle the low grade Bolivian ores, it is practically the only outlet for much of the Bolivian production. Nevertheless, the Bolivian mines are high cost producers, quite apart from the extortionate Bolivian Government taxation which the industry carries.

It will be interesting to see how Washington resolves this, as it seems to us, quite unnecessary situation.

Malayan exports of tin in March jumped to the highest level for well over a year. The export of 5,239 tons of tin sent abroad in March compared with 4,550 tons in February. Bigger shipments were made to the U.S. (640 tons against 425 tons) and to the U.K. (1,935 tons against 1,598 tons).

ZINC.—The shortage of prime Western zinc in the U.S. is reported to be easing, owing to substantial quantities of foreign zinc of this grade having been offered at U.S. ceiling prices.

The price of 19½c. per lb., East St. Louis, the official U.S. price, is equal to £156 per ton. This compares with the Ministry of Materials price of £190 per ton. Unless some action is taken quickly, zinc users in this country will find themselves being priced out of the market on account of the higher price of their raw material. They will find little consolation in the explanation that the government is still taking delivery of zinc under contracts carrying a relatively high price.

COBALT.—U.S. consumption of cobalt last year reached the record figure of 9,933,000 lb., an increase of 2% over 1950.

QUICKSILVER.—A new company has been formed to increase the output of quicksilver in Turkey above the present level of 1,000 kg. of 98-99 per cent pure quicksilver per annum. The deposits which are now being worked and which are to be mined more extensively are near Konya in Central Asia Minor. Some trouble has arisen over the price to be charged for Turkish quicksilver. A quantity of quicksilver was recently sent from Turkey to Austria at a price of $U.S.5.30 per kg.; the Turkish government has fixed the minimum export price at $U.S.7.00-7.50, f.o.b. Istanbul, despite the Spanish offer of 100 per cent pure quicksilver at $U.S.6.50 per kg.

URANIUM.—Reports from New Zealand last week-end suggested that the largest uranium field yet discovered is situated in the mountains of South Island. No official statement has yet been made, and security measures will in any case limit the amount of information which can be given. The report states that uranium was found in the remains of gold dredges about seven years ago, and that work has been proceeding ever since that discovery.

The South Australian and Federal Governments have now reached agreement in principle with Britain and America for the full and early development of uranium deposits at Radium Hill, South Australia (see *The Mining Journal*, Mar. 28, p. 322).

DIAMONDS.—The first quarter of this year has witnessed a further sharp increase in diamond sales. According to figures announced this week by De Beers sales of gems in the quarter totalled £13,088,133 compared with £10,817,292 in the December quarter and £11,296,231 in the first quarter of 1951. The improvement in industrial diamond sales was even more marked, the corresponding figures being £5,780,352 for the first quarter of this year, £4,546,457 for the December quarter and £2,887,817 for the first quarter of 1951. At this rate it seems probable that last year's record diamond sales (gem and industrial combined) of £65,000,000 will be substantially exceeded.

Due to the Easter holidays, The Mining Journal went to press on Wednesday evening of this week, instead of Thursday evening as usual.

The London Metal Market

(From Our Metal Exchange Correspondent)

Once again the week has brought no definite news to the tin market, and prices have fluctuated within very narrow limits, and the amount of business transacted has shrunk still further. There have been signs that the contango which has now existed for a number of weeks is likely to become smaller, but it is hoped that it will not disappear altogether.

As we write (Wednesday) the negotiations between the R.F.C. and Bolivia drag on, and speeches have been made on both sides of the question, the one maintaining that under no circumstances must an agreement be concluded that will force America to implement the "increase-in-price clause" in their agreements with the U.K., Indonesia and Belgium, the other that Pan-American solidarity is being disturbed by a situation which is being created in Bolivia through one of her chief exports being blocked, as post-war developments in the tin smelting industry have left the Texas smelters as the only efficient place for treatment of their tin ores.

The copper price seems to have steadied at around 36c.-40c. per lb. with payment in dollars and £350 a ton with payment in £ Sterling, whilst the lead and zinc market are both featureless, but with a continuing weaker undertone.

On Wednesday, the official close on the tin market was: Settlement price £961, Cash Buyers £961, Sellers £961 10s.; Three months' Buyers £963, Sellers £964. In the afternoon the market was steady. Turnover for the day was 45 tons. Approximate turnover for the week was 215 tons.

The Eastern price on Wednesday morning was equivalent to £970 15s. per ton, c.i.f. Europe.

Iron and Steel

Markets this week have been overshadowed by the threat of a coast to coast steel strike in the U.S.A., timed to begin on Wednesday. Unless there is a speedy settlement the consequences will be disastrous in America and scarcely less so in this country. Shipments of the 1,000,000 tons of U.S. steel arranged by Mr. Churchill in January last have just begun. It was hoped that 250,000 to 300,000 tons would be cleared before the end of June, but this traffic may be brought to a full stop, in which case British steel using industries will be badly hit.

Home production in March was largely satisfactory. In spite of all the difficulties the output of pig iron was the best ever, and ingot production was the very best since April 1951. But the industry still needs that 1,000,000 tons from America and without it will be in dire straits.

Once again the inadequacy of the coke supply is indicated as the chief bottleneck. During the next few weeks three new blast furnaces built on the North East Coast will be ready for operation, and a fourth at Kettering, Italian labour has already been recruited. But to put into operation these furnaces which are capable of increasing the pig iron output by 300,000 tons a year, an extra 300,000 tons of coke will be required.

A statement by the British Iron & Steel Federation reveals a positive deterioration in the coke position. Last month stocks were drawn upon at the rate of 2,000 tons a month, and the total stocks on the ground at the iron works now represent only four days' supply which is less than a safe minimum.

It is categorically stated that arrangements to bring more blast furnaces into operation cannot be completed—urgently though the additional output of pig iron is needed—until the deliveries of furnace coke are increased by at least 6,000 tons a week.

There will be no holiday stoppages at the iron and steel works, except where compulsory curtailments are imposed by the lack of raw materials. Moreover, a few consignments of American and Japanese steel are expected to arrive before the end of the week. For the present, however, the licensing authorities are not disposed to relax the restrictions upon the use of iron and steel. In this respect they refuse to take risks. Thus improvement in the second period allocations is the exception rather than the rule and export quotas are also restricted.

British steel prices still compare favourably with American, European and Japanese quotations, and latest reports from Germany indicate the probability of a rise in German steel and scrap prices in the near future.

APRIL 9 PRICES

COPPER

Electrolytic ... ... £231 0 0 d/d

TIN

(See our London Metal Exchange report for Wednesdays prices)

LEAD

Soft foreign, duty paid ... ... £163 0 0 d/d
Soft empire, including secondary lead ... £163 0 0 d/d
English lead ... ... £164 10 0 d/d

ZINC

G.O.B. spelter, foreign, duty paid ... £190 0 0 d/d
G.O.B. spelter, domestic... ... ... £190 0 0 d/d
Electrolytic and refined zinc ... ... £194 0 0 d/d

ANTIMONY

English (99%) delivered, 10 cwt. and over ... ... £340 per ton
Crude (70%) ... ... £275 per ton
Ore (60% basis) ... ... 40s./42s. 6d. nom. per unit, c.i.f.

NICKEL

99.5% (home trade) ... ... £454 per ton

OTHER METALS

Aluminium, £154 per ton.
Bismuth, 25s. lb.
Cadmium, 18s. 3d. lb.
Chromium, 6s. 3d. lb.
Cobalt, 20s. lb.
Gold, 248s. f.oz.
Iridium, £65 oz. nom.
Magnesium, 2s. 10½d. lb.
Osmiridium, £35 oz. nom.
Osmium, £70 oz. nom.
Palladium, £8 10s. oz.
Platinum (scrap), £33.
Platinum, £27/33 5s. nom.
Rhodium, £45 oz.
Ruthenium, £30 oz.
Quicksilver, £73/£73.10s. ex-warehouse.
Selenium, 25s. nom. per lb.
Silver (bar), 77d. f.oz. spot and forward.
Tellurium, 19s. lb.

ORES, ALLOYS, ETC.

Bismuth ... ... 50% 10s. lb. c.i.f.
40% 9s. lb. c.i.f.
Chrome Ore—
Rhodesian Metallurgical (lumpy) £13 per ton c.i.f.
" " (concentrates) £13 per ton c.i.f.
" " Refractory £12 12s. per ton c.i.f.
Baluchistan Metallurgical ... £14 16s. per ton c.i.f.
Magnesite, ground calcined ... £26 - £27 d/d
Magnesite, Raw ... ... £10 - £11 d/d
Molybdenite (85% basis) ... 103s. 1½d. per unit c.i.f.
Wolfram (65%), U.K. ... 485s. nom. c.i.f.
Tungsten Metal Powder (for steel manufacture) ... 35s. nom. per lb. (home)
Ferro-tungsten ... ... 33s. nom. per lb. (home)
Carbide, 4-cwt. lots ... ... £30 3s. 9d. d/d per ton
Ferro-manganese, home ... £43 15s. 2d. per ton
Brass Wire ... ... 2s. 8½d. per lb. basis.
Brass Tubes, solid drawn ... 2s. 1½d. per lb. basis.

U.K. PRIMARY METAL STATISTICS — FEBRUARY

(long tons)

	Refined Copper	*Lead†*	*Slab Zinc*	*Tin Metal*
Stocks in U.K. Feb. 1				
Government	59,175	68,101	30,052	200§
Consumers	27,942**	21,730	14,487	4,708‖
Imports	15,838	22,303	14,870	747
Production	10,115	6,631	4,610	2,045*
Consumption	33,178	15,858	16,736	1,993
Exports & Re-exports	48	133	Nil	229
Stocks U.K. Feb. 29‡				
Government	56,776	85,637	32,232	200§
Consumers	23,838	18,569	14,846	5,168‖

(Source: British Bureau of Non-Ferrous Metal Statistics)

* Estimated by International Tin Study Group.

† Includes imported virgin lead and English refined from domestic ores and from secondary metal.

§ Excluding strategic reserves.

‖ Including tin in official warehouses but excluding smelter carry over.

‡ In addition U.K. stocks of blister copper at the end of February were 22,509 tons; of zinc concentrates were 41,693 tons and of tin in ore were 1,681* tons.

**Revised.

THE MINING MARKETS

(By Our Stock Exchange Correspondent)

It has been a most uninteresting week in the Stock Exchange. This market report covers one day less than usual owing to the fact that we go to press a day earlier.

Gilt-edged stocks eased. The balance of payments figures for 1951 served as a reminder of the magnitude of the Chancellor's task, and the results of the County Council elections upset confidence. As a counter balance, the lower gold drain for March gave some promise of steadier financial conditions ahead. Sterling turned easier abroad and this acted as a drag, since recent firmness has to some extent been based on the strength of the £ overseas. Both gilts and industrials, however, finished the week rather more steadily than they began it.

Copper shares were generally quiet and dull although they presented some features of interest. Rhodesia Katanga encountered further profit-taking and fell back to 11s. 6d. Chartered, however, were good on the increased distribution. The company declared a dividend of 40 per cent compared with 33⅓ per cent for last year. This caught the market by surprise and the shares rose sharply, later encountering some profit-taking. Many market men did not expect any increase this year since the Board are known to be conservative in policy. Rio Tinto shares hardened following the Chartered result; they are also a holding company in Rhodesian copper and investors proved optimistic. The dividend is due in June. Mazapil Copper rose as high as 38s. bid before reacting on profit-taking. They have risen over 10s. in the space of a couple of weeks following favourable estimates of a possible take-over price. Esperanza Copper and Sulphur Co. announced that first shipments of ore are expected to take place in April. Crushed ore already sold was not ready until mid-January owing to late delivery of equipment and especially bad weather postponed chartering.

West African gold issues were again dull. Ashanti, Ariston and Konongo all recorded reduced profits for March. The latter company's report, however, attracted favourable attention. Boabedroo developments have turned out well, disclosing high grade ore.

In the miscellaneous market, Zams went ahead after the meeting. A shareholder asked the chairman for his comments on the rumour that the company was likely to emigrate. The chairman said that the board had the matter under their consideration at all times but that a statement at the present juncture would be inadvisable. In some quarters an optimistic interpretation was put upon this.

The rift in European opinion in South Africa and the apparent willingness of the Prime Minister to go against the High Court decision continued to upset the Kaffir market. While this could, no doubt, be settled without serious trouble, the prospect of native civil disobedience and the possibility of labour troubles and riots among Indian and African employees cannot be ruled out. These factors brought idle conditions and the marking down of many issues. There seems, however, to have been little selling and, paradoxically, some jobbers are reported to be short of stock.

The supply of electricity on the Rand caused some anxiety as demands are so heavy that they cannot always be met in full. Anglo American Corporation announced a new issue. Ordinary shareholders will be offered one new 10s. share for every 10 held, at a price of £6 10s. The issue is underwritten by Consolidated Mines Selection. The reports of Daggafontein and Western Reefs confirmed that plans are in hand for the production of sulphuric acid and additional gold is also likely to be recovered from the roasted pyrites.

International Nickel and other dollar shares were mostly easier following Wall Street. The company announced that a 7½-mile pipeline has now been completed through which the concentrate of nickel-copper is being pumped from the concentrator to the reduction plants. The pipeline is a part of the company's underground expansion programme and should lead to further economies in transportation costs.

FINANCE	Price Apr. 8	+ or − on week
African & European	2⅜	
Anglo American Corpn.	6¼	−⅛
Anglo-French	20/4½	−3d
Anglo Transvaal Consol.	32/6	
Camp Bird	11/1½	−1½d
Central Mining (£1 shrs.)	35/-	−1/3
Consolidated Goldfields	48/9	+7½d
Consol. Mines Selection	27/6	
East Rand Consols	3/3	
General Mining	4⅛	−⅛
H.E. Prop.	33/9	+1/3
Henderson's Transvaal	11/9	+3d
Johnnies	3⅛	
Rand Mines	5	−⅛
Rand Selection	38/9	−7½d
Union Corporation	8½	−⅛
Vereeniging Estates	4⅜	−⅛
Writs	31/3	
West Wits	43/9	
RAND GOLD		
Blyvoors	42/-	+3d
Brakpan	19/3	−3d
City Deep	38/9	
Consol. Main Reef	36/3	
Crown	2⅛	−⅛
Daggas.	3⅛	
Dominion Reefs	2/-	
Doornfontein	24/8	+1½d
Durban Deep	3½	+⅛
E. Daggas	21/3	+7½d
E. Geduld (4/- units)	45/-	
E. Rand Props.	3⅜	+⅛
Geduld	6⅛	+⅛
Grootvlei	34/9	
Libanon	13/9	
Luipaards Vlei	18/9	−3d
Marievale	22/-	
Modderfontein B.	5/7½	+3d
Modderfontein East	28/9	−1/3
New Kleinfontein	31/10½	
New Pioneer	14/3	+3d
Randfontein	20/-	
Robinson Deep	13/-	−3d
Rose Deep	30/-	
Simmer & Jack	6/6	
Springs	8/3	−3d
Sub Nigel	2⅜	
Van Dyk	12/3	+3d
Venterspost	20/7½	+4½d
Vlakfontein	18/6	+3d
Vogelstruisbult	26/6	−6d
West Driefontein	6⅜	+⅛
W. Rand Consolidated	50/-	
Western Reefs	41/10½	+7½d
O.F.S		
Alpha F.S.A.	6/3	
Blinkpoort	18/1½	+7½d
Central Mining F.S.	3/9	
Freddies	7/3	+3d
Freddies N.	6/6	+3d
Freddies S.	7/9	+6d
F.S. Geduld	3⅜	+⅛
Geoffries	18/4½	−4½d
Harmony	19/-	
Lydenburg Estates	10/-	
Middle Wits.	16/3	−3d
Ofsits	39/4½	+7½d
President Brand	15/6	+6d
President Steyn	13/6	+6d
St. Helena	18/-	+3d
U.F.S.C. & G.	7/-	+3d
Virginia Deb.	73	
Virginia Ord.	10/-	+1½d
Welkom	30/-	−7½d
Western Holdings (New)	3⅜	+⅛
WEST AFRICAN GOLD		
Amalgamated Banket	1/6	−1½d
Ariston	8/7½xd	+1½d
Ashanti	19/9xd	−3d
Bibiani	7/-xd	+6d
Bremang	2/7½	
G.C. Main Reef	3/3	
G.C. Selection Trust	6/3	
Konongo	2/9	
Kwahu	4/3	
London & African Mng.	1/6	
Lyndhurst Deep	1/3	
Marlu	1/7½	
Nanwa	5d	
Taquah & Abosso	4/-	
AUSTRALIAN GOLD		
Boulder Perseverance	2/1½	−1½d
Golden Mile of Kalgoorlie	9/3	−3d
Great Boulder Prop.	5/6	
Great Western Consol.	6/10½	
Lake View and Star	15/9	−3d
Mount Morgan	15/9	−3d
North Kalgurli	13/-	
Paringa	6d	
Sons of Gwalia	9/9	
South Kalgurli	8/4½	
Western Mining	7/3	
Wiluna	5/7½	
MISCELLANEOUS GOLD		
Cam and Motor	38/3	−7½d
Champion Reef	7/3	
Falcon Mines	7/9	−3d
Globe & Phoenix	24/6	
MISCELLANEOUS GOLD (contd.)		
G.F. Rhodesian	6/7½	−1½d
London & Rhodesian	5/-	+1½d
Motapa	2/-	
Mysore	4/6	
New Guinea	1/3	−1½d
Nundydroog	5/9	
Ooregum	2/9	
Oroville	11/3	
St. John d'El Rey	31/3	
Zams	38/9	+1/3
DIAMONDS		
Anglo American Inv.	4⅜	−⅛
Casts	31/6	+6d
Cons. Diam. of S.W.A.	4⅜	−⅜
De Beers Defd. Bearer	70/6	−1/-
De Beers Pfd. Bearer	14⅜	−⅛
COPPER		
Chartered	61/3	+2/6
Indian Copper	3/3	−3d
Messina	4⅜xrts	−⅛
Nchanga	7⅜	+⅜
Rhod. Anglo-American	57/9	
Rhodesian Selection	17/-	+6d
Rhokana	20⅜	−⅛
Rio Tinto	21⅛	+⅛
Roan Antelope	12/3	
Selection Trust	37/3	−3d
Tanks	57/6	−6d
Tharsis Sulphur Br.	45/-	−2/6
TIN (Eastern)		
Anglo-Burma	2/9	
Ayer Hitam	25/6	−1½d
Bangrin	9/1½	
Gopeng	12/3	
Hongkong	9/3	+3d
Ipoh	23/-	
Kamunting	10/10½	+1½d
Kepong Dredging	6/9	−1½d
Kinta Tin Mines	14/6	−3d
Kramat Pulai	4/10½	
Malayan Dredging	21/7½	+4½d
Pahang	15/1½	+4½d
Pengkalan	9/4½	
Petaling	15/3	+3d
Rambutan	13/9	
Siamese Tin	21/3	+7½d
Southern Kinta	14/7½	+3d
S. Malavan	24/-	+3d
S. Tronoh	16/9	+6d
Sungei Kinta	18/1½	
Tekka Taiping	8/9	
Tronoh	25/-	+3d
TIN (Nigerian and Miscellaneous)		
Amalgamated Tin	9/-	+3d
Beralt Tin	22/3	+7½d
Bisichi	3/10½	+4½d
British Tin Inv.	15/6	
Ex-Lands Nigeria	4/10½	+1½d
Geevor Tin	11/-	−3d
Gold & Base Metal	3/9	
Jantar Nigeria	5/3	−3d
Jos Tin Area	11/-	
Kaduna Prospectors	4/3	
Kaduna Syndicate	5/4½	+1½d
London Tin	5/3	+1½d
Riben Valley	1/-	
United Tin	2/6	
SILVER, LEAD, ZINC		
Broken Hill South	43/9	−3d
Burma Mines (3/6 sh.)	2/3	
Consol. Zinc	24/4½	+7½d
Lake George	16/10½	+1½d
Mount Isa	34/9	−6d
New Broken Hill	24/-	+3d
North Broken Hill	59/-	+3d
Rhodesian Broken Hill	17/4½	−1½d
San Francisco Mines	34/-	+3d
Trepca	3/6	−1½d
MISCELLANEOUS BASE METALS & COALS		
Amal. Collieries of S.A.	47/6	
Associated Manganese	43/9	+3/1½
Chinese Engineering	3/9	
C.P. Manganese	47/6	+2/6
Natal Navigation	3⅞	−⅛
Wankie	17/-	
Witbank Colliery	2⅜	
CANADIAN MINES		
Dome	$34½	+$1
Hudson Bay Mining	$100	−$5
International Nickel	$78½	−$1½
Mining Corpn. of Canada	£5⅜	+£⅛
Noranda	$142	+$1
Quemont	£8⅛	+£⅛
OIL		
Anglo-Iranian	5⅞	+⅛
Apex	45/-	+7½d
Attock	23/1½	−7½d
Burmah	63/1½	+7½d
Canadian Eagle Bearer	32/3	+1/-
Mexican Eagle	2/1½	−1½d
Shell	4⅜	+⅛
Trinidad Leasehold	31/-	+10½d
T.P.D.	29/4½	+10½d
Ultramar	34/4½	+4½d

Anglo American's Rand Interests

The appearance of the 1951 Kaffir annual reports provides a useful opportunity for reviewing the group of Rand gold mining companies under the aegis of the Anglo American Corporation. Of the group's six producers, five are situated on the Far Eastern section of the field, namely Brakpan, Springs, Daggafontein, East Dagga and South African Land. The other mine in production, Western Reefs, lies on the western end of the belt in the Klerksdorp district and, adjoining it, is Vaal Reefs, which is still in the development stage and which was the subject of a note in our last week's issue.

Another mining venture in the Far Western part of the Rand is the Western Ultra Deep Levels, a company formed to undertake the exploration of the reefs beyond the deep-level boundaries of Blyvooruitzicht and West Driefontein.

Additional to these direct interests is "Anglos" preponderating holding in West Rand Investment Trust, a subsidiary whose assets consist of large blocks of shares in companies of the West Wits line, including the parent undertaking, West Witwatersrand Areas. These investments promise to become increasingly valuable as time goes on.

During the past year, the Corporation has again received substantial dividends from its Rand producing gold mines. All the mines obtained the benefits during 1951 from sales of gold at premium prices for use in industry and the arts, which brought them in an additional revenue of £1,178,506.

The lower tonnage milled resulted mainly from the shortage of labour, while working costs were generally higher in consequence partly of upward adjustment in wages but mainly on account of rising prices of stores and materials.

While on some of the mines little capital expenditure is now necessary, on others provision has still to be made for further expansion. Plants for the extraction of uranium are being erected on Daggafontein and Western Reefs, and although they are costing more than originally anticipated, loans to meet the expenditure are being made by U.S.A. and U.K. agencies.

The operating and financial results of the group's producing mines are summarized in the tables on the next page, while the activities of each mine over the past year are discussed in the individual paragraphs which follow.

In addition to its Rand interests, the Anglo American Corporation participates in a wide variety of mining ventures, chief among which are extensive interests in the O.F.S. gold field and in copper and diamond mines. Space precludes any consideration of them here, but a review of these other activities will appear in *The Mining Journal Annual Review* to be published next month.

Brakpan's Good Developments

The feature of Brakpan Mines' 1951 annual report is the disclosure of gold values on the Footwall reef, which is of much importance to this Far Eastern member of the Anglo American group. The tonnage dealt with of 1,375,000 tons showed a small decrease of 26,000 and .02 drop in yield at 3.76 dwt. Revenue per ton was 1s. 6d. higher at 49s. 2d., but against this, working costs increased by 3s. 3d. to 37s. 4d. per ton milled, and the resultant profit per ton was 1s. 9d. lower at 11s. 9d. The total working profit dropped by £137,131 to £810,895, but it did not compromise the dividend which was again 2s. 1½d. per share. The company retains its holding of 361,067 shares in South African Lands from which it received last year, £80,074 in dividends.

A slightly higher footage of development was done—71,013 ft. against 69,521 ft., and of the 54,845 ft. sampled, 27.2 per cent were payable averaging 12.26 dwt. over 42.36 in. Included in this footage is 8,971 ft. of work on the Footwall reef, of which 6,605 ft. were sampled, 28.9 per cent being payable averaging 15.74 dwt. over 91.81 in., equal to 1,445 in.-dwt. This good development augurs well for the mine.

The tonnage of ore reserves is increased by 139,800 to 3,965,000 tons, of a value of 4.59 dwt. Included in this computation are 89,400 tons on the Footwall reef averaging 4.86 dwt. Owing to the irregularity of the pyritic bands in this deposit and the irregular distribution of the gold therein, it must be expected that there will be a wide difference between the value of payable development and that of the reserve tonnage based on this development. The company has capital expenditure to meet. It is engaged in shaft sinking which called for £20,574 last year and it is estimated that £80,000 will be expended during the current year.

Springs Milling Grade

The 1951 annual report of Springs Mines does not show up so well as did that for 1950. A lower tonnage was dealt with, revenue was scaled down and the working profit of £534,389 went against £745,260 the previous year. 2,004,000 tons of ore were crushed (compared with 2,125,500 tons), recovery being 2.61 (2.63) dwt. Revenue per ton increased by 10.6d. to 34s. but working costs rose by 2s. 6d. to 28s. 8d. per ton and the profit was 1s. 8d. per ton less at 5s. 4d. The dividend was scaled down to 9d. per share against 1s. 1½d. in 1950.

Development work gave satisfactory results. On the Main reef 32,315 ft. were driven and of the 26,170 ft. sampled, 39.2 per cent proved payable averaging 20.1 dwt. over 20.22 in. In addition, 8,271 ft. of work was accomplished on the Kimberley reef horizon, of which 7,360 ft. were sampled giving a pay percentage of 12.4 and averaging 6.0 dwt. over 45.5 in. This work was hardly sufficient to replace the ore mined and the ore reserves dropped by 16,600 tons to 4,025,900 tons, value being the same 4.32 dwt. They include 284,200 tons on the Kimberley Reef Series. There has been a progressive decline in the payable footage done on the Kimberley Reef horizon over the last three years and a similar decrease in the tonnage in ore reserves on this reef. The payable area has been thoroughly explored and the indications are that there is very little more ground to open up.

The substantial difference between the milling grade and the value of the ore reserves indicates that a stepping up of the mill head value would result in a big improvement.

"Sallies" Near-Capacity Milling

Although the 1951 results of South African Land—one of the Far Eastern Rand members of the Anglo American group generally known as "Sallies"—did not constitute a record, the tonnage was of a very high order and revenue and profit were definitely the best for many years. Revenue from gold sales reached £3,153,000 or £385,000 higher than in 1950. The chief reason for this improvement was the rise in tonnage milled—1,380,000 (against 1,256,000 tons). This throughput has only been exceeded twice in the mine's history and is almost up to the full capacity of the plant. It results from the benefits of capital expenditure on ventilation and sub-vertical shafts. The yield of 3.5 dwt. was similar to that of the previous two years. Working revenue per ton was 45s. 9d. against 44s. 2d. and with costs lower at 29s. 8d. (30s. 1d.), the profit per ton rose by 2s. 1d. to 16s. 2d. Total working profit came out at £1,114,142—being the highest since 1944. This enabled the dividend to be increased from 3s. to 4s. 3d. per share, absorbing £525,938. Government taxation and Lease payments called for a bigger amount, £525,472 (£367,577), but capital expenditure was considerably less, £51,792.

A larger footage of development was accomplished—84,000 ft. against 69,000 ft., but results were not quite so good as the previous year. Of the 22,000 ft. sampled 42.6 per cent against 46.8 per cent was payable, averaging 12.22 dwt. over 30.7 in. Using the same pay limit, viz., 2.9 dwt., a recalculation of ore reserves at the end of 1951 showed a total of 3,324,000 tons, value 4.71 dwt. This compares with 3,022,000 of 4.71 dwt. previously.

Daggafontein's Production Results

Inadequacy of native labour supply was responsible for a drop in the milling tonnage during 1951 of Daggafontein Mines. There was an increase in revenue per ton but it was not sufficient to counter the increase in costs and the resultant profit per ton was down, while aggregate profit was lower than in the previous year.

MILLING AND DEVELOPMENT RESULTS

Company	Year Ended Dec. 31	Milling Results: Tons Milled (000)	Grade Milled (dwt.)	Oz. Yielded	Results Per Ton: Revenue* s. d.	Cost s. d.	Profit s. d.	Development: Footage Advanced	Footage Sampled	Per cent Payable	Average Value (in.-dwt.)	Ore Reserves: Tons (000)	Value (dwt.)	Width (in.)
Brakpan Mines	1950	1,401	3.8	264,792	47 8	34 2	13 6	69,521	54,940	25.9	481	3,825	4.58	41.82
	1951	1,375	3.8	258,755	49 2	37 4	11 10	71,013	54,845	27.2	519	3,965	4.59	43.33
Springs Mines	1950	2,125	2.6	279,218	33 2	26 2	7 0	40,306	33,500	31.2	431	4,042	4.32	43.91
	1951	2,004	2.6	261,108	34 1	28 9	5 4	40,586	33,530	33.3	395	4,026	4.32	43.56
S.A. Lands	1950	1,256	3.5	219,790	44 2	30 1	14 1	68,772	48,150	46.8	388	3,022	4.61	42.00
	1951	1,380	3.5	241,993	45 9	29 8	16 1	84,119	57,380	42.6	375	3,324	4.71	42.29
Daggafontein Mines	1950	2,904	5.0	732,431	63 8	21 9	41 11	54,559	39,880	44.6	320	14,608	5.78	43.46
	1951	2,810	4.9	688,377	63 11	24 2	39 9	60,132	47,800	45.1	350	14,430	5.73	43.78
East Daggafontein	1950	1,189	3.9	234,484	49 9	27 8	22 1	61,685	49,115	32.7	318	4,691	4.59	36.88
	1951	1,183	3.7	216,351	47 10	29 0	18 10	60,735	45,445	32.4	295	4,685	4.51	36.83
Western Reefs	1950	1,114	4.7	264,268	59 10	31 11	27 11	82,318	34,530	48.8	426	4,173	5.23	45.79
	1951	1,222	4.4	268,786	57 5	32 9	24 8	83,446	41,955	44.5	432	4,603	5.08	46.72

*Includes revenue from premium gold sales.

The mill dealt with 2,810,500 tons against 2,904,000 tons. Revenue per ton was 63s. 11d. (63s. 8d.), but costs increased by 2s. 5d. per ton, with the result that the profit per ton of 39s. 9d. was 2s. 1d. per ton lower, and the total working profit of £5,592,742 was £494,646 less than the figure for the previous year. This result, coupled with the lower amount of £64,111 received by way of dividends on shareholdings necessitated the distribution to shareholders being reduced to 6s. per share (against 6s. 6d.) absorbing £2,100,000.

Although the financial results were not so good, mine developments were satisfactory, with both the Main and Kimberley Reefs pay ratio and value living up to those of the previous year. Of the 26,195 ft. developed on the Main Reef, 18,405 ft. were sampled giving a pay percentage of 47.7 (against 42.4) and averaging 15.81 dwt. over 16.79 in. More work was done on the Kimberley reef—33,937 ft. and of the 29,395 ft. sampled 43.4 per cent proved payable of a value of 13.27 dwt. over 30.78 in. Ore mined was not sufficient to arrest a downward trend in reserves, which are 178,100 tons lower but still at the substantial figure of 14,430,300 tons, value 5.73 dwt. Included in this aggregation are 5,045,700 tons of 6.09 dwt. on the Kimberley Reef series. It will be recalled that a new reduction plant, with a capacity of 750,000 tons was installed to deal with the Kimberley ore and has been functioning since the end of 1949.

Labour Shortage Reduces Throughput at East Dagga

The monthly output figures of East Daggafontein during 1951 gave a forewarning that operations for the twelve-month would not be up to the record of the previous year, and the annual report proves this to be a correct deduction.

Tonnage milled of 1,183,000 was less by 6,000 tons due chiefly, as the Chairman points out, to decreased labour supply. Yield decreased by 0.28 dwt. to 3.66 dwt. and revenue per ton by 1s. 10.8d. to 47s. 10.3d. This, with an uptrend in costs of 1s. 5d. per ton to 29s. 0.7d., resulted in the profit per ton dropping by 3s. 3d. to 18s. 9d. Total working profit came to £1,111,834 or £202,027 less than in the previous year, and necessitated the dividend being scaled down to 2s. 9d. against 3s. 6d., which called for £512,875.

Not only was milling restricted by labour shortage but it apparently hindered underground work. The rich Kimberley reef did not live up to the promise which the work done in 1950 had given, though the Main Reef leader gave a better result. On this latter a footage of 33,589 ft. went against 34,646 ft. the previous year and of the 24,145 ft. sampled (against 26,185 ft.) 37.3 per cent was payable averaging 30.83 dwt. over 8.47 in. In addition, 27,146 ft. (slightly more than in the previous year) was opened up on the Kimberley Reef, of which 26.9 per cent (33.7) proved payable averaging 51.04 dwt. over 6.84 in. Ore reserves show a drop of 5,400 tons to 4,685,200 tons of 4.51 dwt. As with most mines the pay limit had to be raised (2.8 dwt. against 2.6 dwt.).

Western Reefs Long Term Future

The outlook for Western Reefs, the expanding Klerksdorp producer in the Anglo American group, is enhanced by a study of the annual report for last year. Large capital expenditure in excess of that already incurred, is necessary and it is estimated that £500,000 will be required during the current year. The sub-vertical shaft (sunk jointly with Vaal Reefs) is expected to be in commission by the end of the year, enabling the company to tackle the Vaal Reef horizon early in 1953. If borehole promise is confirmed, the results on this reef should justify further expansion of operations.

During 1951 the first units of the extension to the reduction plant came into operation and the tonnage milled was 107,500 more than for the previous year at 1,222,000 tons. The yield was 0.34 dwt. less at 4.40 dwt. Revenue per ton was down—57s. 5d. against 59s. 10d.—and costs rose by 10d. per ton to 32s. 9d. with the result that profit per ton showed a decrease of 3s. 3.9d. to 24s. 7.6d. per ton. Working profit dropped from £1,558,044 to £1,505,180, but the dividend was maintained.

The benefit of increased development was seen and included in the 83,446 ft. accomplished was a footage of 3,394 ft. of prospecting work in a portion of the farm Goedgenoeg, over which the company holds rights though the ground is outside its own mineral lease. Of the 41,955 ft. sampled, 44.5 against 48.8 per cent was payable, averaging 16.11 dwt. over 26.79 in. Ore reserves, down-graded from 3 to 2.8 dwt., are 4,602,700 tons value 5.08 dwt. (4,173,000, value 5.23 dwt.).

FINANCIAL RESULTS

Company	Year Ended Dec. 31	Working Profit Excluding Gold Premium £	Premium Gold Sales £	Revenue from Shareholdings £	Sundry Revenue £	Sundry Expenses £	Taxation and Govt. Share of Profit £	Net Profit after Tax, etc. £	Capital Expenditure Reserve £	Dividend: Total £	Dividend: Per Share s. d.	Balance Unappropriated £	Issued Capital: Total £	Issued Capital: Share Unit s. d.
Brakpan Mines	1950	899,985	48,041	56,967	7,748	3,793	341,112	667,836	59,810	488,750	2 1½	170,855	1,150,000	5 0
	1951	651,820	159,075	80,074	8,654	2,777	392,321	504,525	51,352	488,750	2 1½	153,373	1,150,000	5 0
Springs Mines	1950	693,629	51,631	3,950	6,713	3,183	67,031	685,709	32,849	568,688	1 1½	235,613	2,527,500	5 0
	1951	373,916	160,473	1,447	6,383	2,486	105,553	434,180	39,194	379,125	0 9	261,109	2,527,500	5 0
S.A. Lands	1950	845,706	40,386	1,368	5,936	2,322	367,577	523,497	112,857	371,250	3 0	128,060	433,125	3 6
	1951	964,429	149,713	402	7,677	1,890	525,472	594,859	40,998	525,938	4 3	145,189	433,125	3 6
Daggafontein Mines	1950	5,956,477	130,911	81,440	28,629	4,032	3,580,530	2,613,695	317,441	2,275,000	6 6	257,276	1,750,000	5 0
	1951	5,177,623	415,119	64,111	28,877	4,410	3,290,278	2,391,042	281,953	2,100,000	6 0	241,586	1,750,000	5 0
East Daggafontein	1950	1,272,560	41,301	1,816	4,581	2,538	652,613	665,107	—	652,750	3 6	193,742	1,865,000	10 0
	1951	977,608	134,226	971	4,173	2,044	564,614	550,320	39,641	512,875	2 9	180,614	1,865,000	10 0
Western Reefs	1950	1,511,074	46,870	1,276	27,653	6,220	680,011	890,742	—	859,375	2 6	298,575	1,718,750	5 0
	1951	1,345,280	159,900	1,354	19,229	4,881	469,472	1,051,410	216,040	859,375	2 6	262,456	1,718,750	5 0

COMPANY NEWS AND VIEWS

Rand and O.F.S. Mine Returns for March

An all-round recovery in operations was disclosed by the Rand gold mining companies in their returns for March shown in the table below, together with cumulative figures for the current and previous years to date. Only one mine put through a lower milling tonnage (New Modder); six announced a decrease in profits and a similar number a rise in working costs. The remainder made a favourable showing and a further improvement was disclosed by the Orange Free State producers.

A tapering of the loss on milling operations was again shown by Welkom, the O.F.S. producer of the Anglo American group.

Increased profits resulting from higher milling tonnages and lower costs were announced by all Union Corporation producers.

A poor showing was made by Vogelstruisbult with a rise of 2s. 3d. per ton in costs. All other Gold Fields mines announced better returns.

Rose Deep's profit was £2,000 down and New Modder made a poor showing, but the revenue of other members belonging to Central Mining Corporation was better.

All the Johnnies mines dealt with larger tonnages but East Champ d'Or and New State Areas made smaller profits.

The General Mining's producer, West Rand Consolidated, made the best profit this year.

	March, 1952				*Current Financial Year Total to Date*				*Last Financial Year Total to Date*			
Company	*Tons* (000)	*Yield* (oz.)	*Profit* (£000)		*Tons* (000)	*Yield* (oz.)	*Profit* (£000)		*Tons* (000)	*Yield* (oz.)	*Profit* (£000)	
Gold Fields												
Libanon.....	78	15211	34.3	J	717	135,366	329		729	130,989	406	
Luipaards V.	101	18701	48.9	J	890	165,256	472		909	168,657	600	
Rietfontein...	28	6162	28.6	D	81	17,849	84		81	17,998	95	
Robinson	111	18315	12.5	D	332	53,322	29		315	50,630	39	
Simmer & J.	114	19719	19.0	D	369	58,699	53		359	57,172	96	
Sub Nigel....	66	22909	120.1	J	597	209,266	1150		596	224,416	1426	
Venterspost..	100	22500	63.1	J	887	194,723	561		953	200,693	862	
Vlakfontein..	37	13803	79.6	D	109	40,680	232		104	39,874	231	
Vogels.....	76	20178	72.5	D	232	59,912	225		221	54,802	246	
West Drie..	21	6992	17.0	J	41	12,890	21		—	—	—	
Anglo American*												
Brakpan.....	117	21391	40.5	D	335	62,138	115		332	62,227	178	
Daggas.....	234	55962	400.2	D	685	163,849	1164		668	166,507	1300	
East Daggas.	97	17522	66.3	D	285	51,259	199		293	54,225	267	
S. A. Lands..	117	20733	80.2	D	328	59,153	218		331	57,747	235	
Springs.....	167	21742	20.0	D	481	63,237	51		496	64,638	116	
Welkom.....	44	6655	L19.7	D	118	15,900	L102		—	—	—	
W. Reef Ex...	112	23600	107.5	D	321	67,800	306		272	62,415	330	
Central Mining												
Blyvoor	109	67382	596.1	J	973	619,818	5573		789	566,634	5263	
City Deep..	160	30799	26.8	D	457	91,722	84		475	97,894	253	
Consol M.R.	195	26804	44.3	J	1712	233,852	387		1686	227,371	473	
Crown	269	42633	23.3	D	784	129,218	91		783	137,723	356	
D. Roodep'rt	183	30799	84.5	D	525	90,118	237		526	89,529	303	
East Rand P.	216	47302	180.0	D	617	134,627	490		623	126,282	506	
Modder B....	58	6256	7.4	D	169	18,508	22		161	18,299	28	
Modder East	118	13572	24.1	J	1061	124,319	280		1095	131,841	465	
New Modder	17	2646	0.6	J	186	24,731	8		214	23,534	20	
Rose Deep..	86	11494	10.1	D	249	34,279	36		238	33,972	70	
Welgedacht..	34	4074	4.3	J	304	35,774	36		297	34,294	37	
J.C.I.*												
E. Champ ..	32	4806	8.0	D	91	14,387	26		96	13,987	33	
Govt.G.M.A.	224	32763	30.1	D	663	97,529	147		665	92,731	181	
New State..	46	6768	1.0	D	128	19,962	3		173	23,172	15	
Randfontein.	361	42991	30.2	D	1042	126,115	85		955	119,762	159	
Wit. Gold ...	59	7098	2.6	D	177	20,874	7		173	20,262	18	
Union												
East Geduld.	146	43809	347.8	D	432	129,606	1025		424	127,213	1035	
Geduld Prop.	105	15244	37.4	D	314	45,562	115		314	46,513	147	
Grootvlei....	200	43298	280.1	D	573	124,410	791		582	130,937	905	
Marievale...	61	15220	71.1	D	180	44,972	211		180	45,000	227	
St. Helena..	44	8668	3.3	D	130	25,413	5		—	—	—	
Van Dyk	108	15522	12.5	D	317	46,173	37		299	44,055	54	
General Mining*												
S. Roodep'rt.	27	6103	22.3	J	244	54,455	303		238	53,716	202	
W. Rand Con	219	33945	126.5	D	613	95,735	353		604	96,851	462	
Transvaal*												
N. Klerksd'p	10	1192	1.0	D	32	3,623	3		25	2,953	4	
Rand Leases.	188	31489	76.5	J	1652	277,484	725		1696	273,078	866	
Village M.R.	34	5313	16.5	J	307	47,683	158		312	47,326	173	
Others												
N. Kleinf't'n	106	13994	33.1	D	309	40,729	391		316	41,106	132	
Spsarwater...	11	2438	L2.6	D	31	7,036	L10		31	6,927	L9	
W. Nigel*...	10	—	0.6	J	89	—	3		90	—	16	

Notes.—Profit figures are in all cases figures of working profit excluding profit from sale of gold at premium prices. In case of groups marked with an asterisk (*) profit includes sundry revenue. Profit figures preceded by L indicate a loss.

Konongo's Excellent Development Results.—The Profit and Loss Account of Konongo Gold Mines, the high-grade West African gold producer, for the year ended September 30, 1951, showed that net profit, after providing for all charges including £104,000 (£104,500) for taxation and £15,272 (£16,800) for depreciation, amounted to £51,987 compared with £71,240 in the preceding year.

The dividend distribution was maintained at 10 per cent on the £619,258 issued capital in shares of 2s. each which absorbed £32,511. General reserve was strengthened to £200,000 by the allocation of £20,000 (£30,000) leaving the carry forward slightly lower at £60,855 against £61,379 brought in.

Development footage advanced during the year amounted to 6,227 ft. (4,444 ft.) of which 11 per cent (360 ft.) of the 3,275 ft. driven on the reef channel proved payable compared with 21 per cent (630 ft.) in the previous period. Nothing of importance was revealed from development work on the Odumase and Akyenase ore bodies, but as a result of development work on the Boabedroo ore bodies between levels 6 and 10, some 27,000 tons of 27 dwt. ore were added to the ore reserves which, at the fiscal year-end, stood at 177,270 tons averaging 15.2 dwt. per ton over a width of 52 in. compared with 161,538 tons averaging 12.3 dwt. over 49 in.

The most impressive feature of the development work undertaken during the year was in the Boabedroo section on level 10 where a run of 398 ft. averaged 18.5 dwt. per ton over 140 in. which compared with 380 ft. averaging 23.7 dwt. over 58 in. on level 9.

The annual meeting will be held on April 29. Mr. Robert Annan is chairman.

Anglo American Offer One for Ten at £6 10s.—Anglo American Corporation of South Africa have announced that the price at which shareholders, registered on April 15, are to be offered the 623,950 new 10s. ordinary shares in the ratio of one new for every ten held will be £6 10s. per share. Provisional allotment letters will be forwarded to shareholders on or about April 24 and the offer will close on May 12. Pre-

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ferred stockholders will not be entitled to participate in the offer.

The announcement states that the directors are satisfied that provided there is no change in the general situation the present rate of dividend of 6s. per share on the increased ordinary capital can be maintained. The new shares will not rank for the dividend declared on March 26 last.

The share offer has been underwritten by The Consolidated Mines Selection and E. Oppenheimer & Son for a cash commission of 2½ per cent. After underwriting commission the issue will provide £3,954,283. Other expenses are estimated at £5,000. Treasury permission has been obtained for the U.K. portion of the issue.

Anglo American 10s. ordinary shares are currently quoted at £6 7/8 at which price the rights would be worth about 9d. per share.

Modder B. Repays Another 6d.—Modderfontein B. Gold Mines crushed 648,000 tons during 1951 averaging 2.295 dwt. per ton yielding 74,371 f.oz. gold compared with 640,000 tons averaging 2.371 dwt. yielding 75,888 f.oz. gold. Revenue per ton milled was unchanged at 30s. 2d. but working costs rose 6d. to 25s. 5d. and working profit declined 6d. to 4s. 9d. per ton milled. Despite the year's throughput being 18,000 tons more than the total available ore reserves at the end of the previous year, the ore reserve position at the end of 1951 showed available ore reserves amounting to 531,000 tons, a reduction of only 99,000 tons. That only a small part of the available ore reserves were affected by the total tonnage crushed was due to over 50 per cent of the ore being taken from the Hanging Wall Leader and another 10,000 tons from surface dumps which are not included in the ore reserves. This also accounts for the low grade of ore crushed compared with the ore reserves which average 3.8 dwt. per ton over a width of 52 in.

The profit and loss account showed a net profit, after deducting all charges including £77,742 for taxation, of £118,412 compared with £123,976 in 1950. No dividend was paid but a further repayment of capital amounting to 6d. per share was made which reduces the issued capital to £490,000 in 3s. 6d. shares. The carry forward at the fiscal year-end was £229,512 against £172,485 brought in.

Triefus & Co. Continue to Forge Ahead.—The consolidated profit and loss account of Triefus & Co. for the calendar year 1951 revealed an expansion in net trading profit from £189,496 to £215,146 and in gross dividend income from £542 to £6.660, giving a total income of £221,806 compared with £190,038. Expenses were virtually the same as in the previous year, £26,723 against £26,646, but taxation liabilities were heavier at £115,382 against £100,227, leaving a net profit of £79,701 compared with £63,165 in 1950.

The sum of £50,000 (£20,000) was allocated to general reserve bringing that fund up to £120,000 and after distributing 25 per cent on the 5s. preferred ordinary shares and 13 per cent (same) on the 5s. ordinary shares, which absorbed a total net amount of £29,400, the carry forward stood at £9,640 against £9,339 brought in.

UNION CORPORATION, LIMITED

(Incorporated in the Union of South Africa.)

ABRIDGED REPORT OF THE DIRECTORS FOR YEAR 1951

After providing £1,153,000 for United Kingdom Income Tax and Profits Tax the profit for the year is £982,714, plus £282,327 brought forward, making a total of £1,265,041. The Directors have placed £300,000 to the credit of Exploration Reserve Account, have provided £47,000 for Staff Pension Fund contingencies and have declared a final dividend of 4s. 6d. United Kingdom currency per share free of United Kingdom Income Tax, absorbing £418,500, and making, with the interim dividend of 2s. per share, a total distribution of 6s. 6d. per share free of United Kingdom Income Tax or £604,500 for the year, leaving £313,541 to be carried forward.

Holdings of shares, debentures and other securities have been taken into the Accounts at cost or under but in no case above the market value of December 31 last, or, where no market price exists, above the Directors' valuation. At present market prices these holdings show a very substantial surplus over the amount at which they stand in the Balance Sheet. The Directors, as on other occasions, have thought it expedient to write down the book cost of certain holdings below both cost and market price. As a result of the sale of certain shares in a subsidiary company, capital profits previously applied against the cost of the investment in that Company have been freed to the extent of £50,000, and this sum has been placed to the credit of Capital Reserve Account, which now stands at £800,000.

A copy of the Corporation's Annual Trade Cycles Chart, revised to date, is enclosed with the Report.

GOLD MINING INTERESTS

Summary of the operating results for the past year of the Companies operating in the Witwatersrand in which the Corporation is largely concerned:—

	East Geduld Mines Ltd.	Geduld Proprietary Mines Ltd.	The Grootvlei Proprietary Mines Ltd.	Marievale Consolidated Mines Ltd.	Van Dyk Consolidated Mines Ltd.
Tons milled	1,738,000	1,259,000	2,339,000	729,000	1,204,000
Yield per ton (dwt.)	6.00	2.93	4.45	4.97	3.02
Working Costs, per ton	25s. 5d.	27s. 10d.	25s. 0d.	37s. 2d.	38s. 1d.
Working Profit, per ton	53 s. 0d.	10s. 6d.	33s. 1d.	27s. 8d.	4s. 4d.
Total Working Profit	£4,604,000	£658,000	£3,872,000	£1,009,000	£263,000
Net Profit	£2,158,000	£1,154,000	£1,819,000	£512,000	£250,000
Dividends: Total	£1,950,000	£1,077,000	£1,716,000	£450,000	—
Per cent	108½	73½	60	20	—

The net profit figures include revenue from other sources. Thus East Geduld Mines' dividend income in 1951 on its shareholding in The Grootvlei Proprietary Mines was £80,640 and Geduld Proprietary Mines' dividend income in 1951 on its shareholdings in East Geduld Mines and The Grootvlei Proprietary Mines was £770,585.

On Van Dyk, development in the No. 5 Shaft area has commenced. Payment of dividends has been suspended in order to finance this Shaft and initial development therefrom.

ST. HELENA GOLD MINES.—The first ore reserve estimate as at December 31 last showed an amount of 625,000 tons, having a value of 5.9 dwt. over a stoping width of 48 in.

After trial runs the reduction plant came into commission on November 1 and by the year end 81,000 tons of ore derived mainly from development had been milled, resulting in a working loss of £43,995. During the current financial year the mine has shown a small working profit.

The opening up of stopes has not progressed at a rate sufficient to supply the reduction plant with ore to its full capacity, but the position should improve gradually as additional stope faces become available. In order to provide funds to accelerate development work, to cover capital expenditure at the mine, and to repay the temporary loan of up to £1,000,000 granted by the Corporation last year, the Company has raised the sum of £1,700,000 by an issue of 2,125,000 shares at 16s. 0d. per share.

THE WITHOK PROPRIETARY COMPANY.—The borehole in the centre of the Company's property, which was referred to in last year's report, intersected the Main Reef at a depth of 7,034 ft. No values were disclosed.

Interests not under the administration of the Corporation:—

STILFONTEIN GOLD MINING COMPANY.—This Company continues to make good progress in opening up its mine in the Klerksdorp district of the Transvaal and development work has disclosed a high percentage of payability with good values on Vaal Reef. It is expected that production will commence about the middle of 1952.

WESTERN HOLDINGS.—Both of this Company's shafts in its lease area in the Orange Free State have intersected the Basal Reef with satisfactory results. It is expected that production on a small scale with rock from development will start about the middle of 1952.

OTHER MINING INTERESTS

SAN FRANCISCO MINES OF MEXICO.—In the year to September 30, 1951, 597,400 tons of lead-zinc-silver ore were milled compared with 623,000 tons in the previous year. Power cuts in the supply of electricity to the Mine in the later months of the year contributed to the reduction.

The Company's issued capital was doubled in May, 1951, by capitalising £1,028,406 10s. from Reserves and issuing bonus shares to members in the proportion of one 10s. bonus share for each 10s. stock unit held.

CHROME MINES OF SOUTH AFRICA.—Operations continued throughout the year but were again handicapped by the shortage of railway trucks.

Interest not under the administration of the Corporation:—

TSUMEB CORPORATION.—The net profit of this Company for the year ended June 30, 1951, was £2,966,943 compared with £1,495,572 for the previous year and dividends totalling 7s. 9d. per share were declared. During the current financial year dividends totalling 10s. 0d. per share have so far been declared. Steps are being taken to increase the capacity of the Mine and the Mill plant.

OTHER INTERESTS

BAY HALL TRUST.—The net profit for 1951 was £77,435 and a dividend of 6½ per cent free of tax was declared. The Trust's investments as at December 31 last showed an appreciation of £716,014 over book cost of £2,232,419.

BRITISH ENKA.—Production in 1950 was substantially increased. Net profits for the year rose to £315,241 to which was added £217,798 in respect of taxation over-provided in previous years and no longer required, making a total of £533,039. Dividend paid was increased to 10 per cent, absorbing £103,125, and £400,000 was transferred to General Reserve. During 1951 the Company further increased its output.

SOUTH AFRICAN PULP & PAPER INDUSTRIES.—During the year production and sales were again increased. The net profit for 1951, after making provision for taxation and depreciation, amounted to £274,022. Dividends totalling 2s. 0d. per share have been declared compared with 1s. 10½d. per share for previous year. At the Enstra Mill the smaller of the two additional paper machines referred to in last year's Report was brought into production during the latter part of the year under review. Work has started on the erection of the main factory buildings for the Company's new Mill in Natal. To provide further funds for this expansion of operations, the Company last year issued 1,000,000 shares at 40s. 0d. per share.

EXPLORATION

Active exploration work was continued during the year under review by the Corporation and its subsidiary Companies, including Capital Mining Areas in the Bethal District of the Transvaal, and Central Mineral Exploration in the Mlala area of Tanganyika. The Corporation continues to hold the mineral rights on certain farms in the Orange Free State.

Copies of the full Report and Accounts can be obtained on application at the London Office, Princes House, 95, Gresham Street, E.C.2.

METALLURGIST required for London headquarters of the COLONIAL DEVELOPMENT CORPORATION. Applicants should have sound training and practical experience, particularly in mineral dressing. Good salary for successful applicant. Permanent pensionable position. Apply in writing to Head of Personnel, Colonial Development Corporation, 33, Dover Street, London, W.1, quoting serial No. 112.

MINING ASSISTANT required for Pakistan Chrome Mine. Must be British subject. Salary first year, £800; second year, £900; plus c.l.a. £360 per annum. Three months' leave on full pay after each two years' tour, free passage both ways, free quarters, liberal insurances, kit allowance. Write, stating age, qualifications and experience with copies of references, to BOX "L.P.," c/o J. W. Vickers & Co., Ltd., 7/8, Great Winchester Street, London, E.C.2. Engagement subject to Ministry of Labour permission.

SITUATIONS VACANT ADVERTISED ABOVE.—*The Notification of Vacancies Order, 1952, must be complied with where applicable.*

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Extracted from the Annual Report for the Year Ended 31st December, 1951

CAPITAL—£2,500,000 in £1 Shares, £2,026,832 issued, fully paid

		Per ton milled
Tons Milled	1,955,000	
Total Working Revenue	£5,157,000	£2 12 9
Total Working Expenditure	4,100,095	2 1 11
Working Profit	£1,056,905	£0 10 10
Total Profit for the year		£1,099,038
Balance unappropriated at 31st December, 1950		665,121
Transfer from Shareholders' Contingency Reserve		4,000
		£1,768,159
This amount has been dealt with as follows:—		
Funds transferred for Capital Expenditure	£39,464	
Taxation—Provision for year ended 31/12/51, £334,852, less Credit Adjustment in respect of previous years (net) £43,621	291,231	
Forfeited Dividends Account	3,981	
Dividends declared during the year—No. 63 of 3s. 0d. per share and No. 64 of 2s. 6d. per share	557,379	
		892,035
Leaving an unappropriated balance of		£867,124

The **ore reserve** was re-estimated as at 31st December, 1951, as follows:

Reef	Available			Shaft and Safety Pillars			Total		
	Tons (000s)	Value Dwt.	Width Inches	Tons (000s)	Value Dwt.	Width Inches	Tons (000s)	Value Dwt.	Width Inches
Pyritic Quartzites	16	4.1	70.0	—	—	—	16	4.1	70.0
Main Reef	219	4.1	60.0	19	4.1	57.2	238	4.1	59.8
Main Reef Leader	4,392	6.2	40.7	701	6.2	44.1	5,093	6.2	41.2
South Reef	807	4.0	50.7	159	4.5	42.8	966	4.1	49.2
Total ...	5,434	5.8	42.6	879	5.8	44.1	6,313	5.8	42.8

Compared with the previous year the available reserve decreased by 578,000 tons, the value and width remaining unchanged.

The full Report and Accounts may be obtained from the London Secretaries, A. MOIR & CO., 4, London Wall Buildings, E.C.2.

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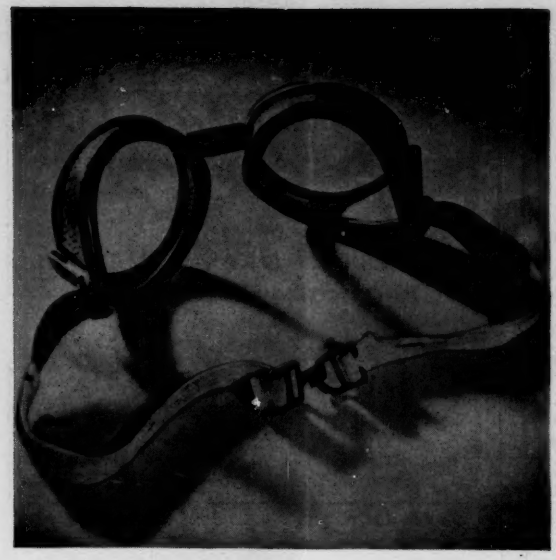

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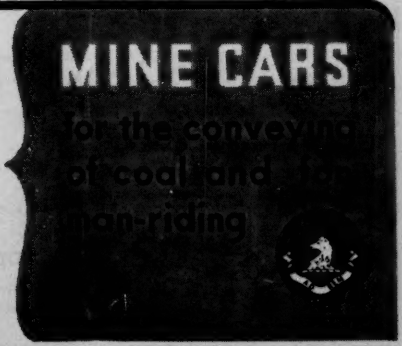

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